

July 12, 1956

# The **IRON AGE**

The National Metalworking Weekly



**H—Iron: Competition For Blast Furnace? P.71**

**How Steel Strike Hit Metalworking P.31**

**Adhesive Bonding: A Progress Report P.36**

**Digest of the Week P—2**

### "Trade Names You Can Trust!"

No matter when or where they are purchased, any length of genuine Hoskins Chromel-P wire can be used with any length of genuine Alumel wire to form a thermocouple which will operate within the close limits specified by Hoskins' Accuracy Guarantee:  $\pm 4^{\circ}\text{F.}$  from  $32^{\circ}$  to  $530^{\circ}\text{F.}$ , and  $\pm \frac{3}{4}\%$  from  $531^{\circ}$  to  $2300^{\circ}\text{F.}$



# HOSKINS Chromel-Alumel

## THERMOCOUPLE ALLOYS

**CONSIDER** for a moment the significance of the statement made above and what it means to users of Hoskins Chromel-Alumel thermocouple alloys the world over. For example, take "The Case of the Ageless Alumel" . . .

Not long ago, an industrial concern in Japan "discovered" 265 pounds of 8-gauge wire hidden away in a remote corner of their plant. Its Inspection Tag, still intact, identified it as being Hoskins Alumel that had been purchased over 20 years ago. How it had escaped being used during all those years no one knew. Inasmuch as it was still in good usable condition, however, the company wrote to inquire if it would be practical . . . or indeed even possible to have a similar quantity of 8-gauge Chromel-P wire specially processed so that its millivoltage would match that of the 1933-vintage Alumel. Imagine their surprise when they were advised that all Chromel-P alloy is specially processed by Hoskins to a uniform standard of quality, and that . . . "regardless of when produced or where purchased, any length of genuine Chromel-P wire can be joined to any length of

genuine Alumel to form a thermocouple which will register true temperature-emf values within the close specified limits of Hoskins Accuracy Guarantee."

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## He delivers the goods

The local distributor of steel products is today's industrial Minute Man. To render the type of service his customers expect, he must be ready for anything, including daily requests for emergency help.

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Throughout the country, distributors are geared for this kind of service. It's their business to carry large inventories of sheets, strip, bars, plates, structurals, tool steel, wire rope, and other essential items; inventories so large that emergency calls can be taken in stride. For the buyer of steel in small and moderate quantities, these inventories, plus quick deliv-

eries, are often the answer to major production problems.

But stocks and deliveries are only a part of the story. You'll find that distributors can be of help in other ways. For instance, they are equipped for handling and processing steel—for shearing, slitting, edging, sawing, flame-cutting, and similar operations. You can turn to them for expert technical advice. In some cases, they can even run tests for you in laboratories of their own.

You'll enjoy knowing the Bethlehem distributor nearest you. He's friendly, cooperative. His middle name is Service, and he'd like the chance to show you why.

BETHLEHEM STEEL COMPANY  
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Bethlehem Pacific Coast Steel Corporation  
San Francisco



*Call the distributor—your Shopping Center for Steel*

July 12, 1956—Vol. 178, No. 2

# The IRON AGE

## Digest of the Week in Metalworking

Starred items are digested at right.

### EDITORIAL

Why is There a Steel Strike? ..... 7

### NEWS OF INDUSTRY

*Special Report: How Strike Hit Metalworking ..	31
*Government: GM Named in Antitrust Suit ..	35
*Manufacturing: Adhesives Go Big Time ..	36
*Maintenance: Labor Costs Can Be Cut ..	37
*Production: What's Forging 2nd Half Outlook ..	38
*Expansion: Canadian Mills Increase Capacity ..	40
*Fuel: Gilsonite Offers New Power Source ..	42
Personnel: Iron Age Salutes ..	61
Iron Age Introduces ..	63
Metalworking Briefs ..	156

### NEWS ANALYSIS

Newsfront ..	29
Report to Management ..	45
*Automotive Assembly Line ..	48
This Week in Washington ..	53
*West Coast Report ..	57
Machine Tool High Spots ..	59

### TECHNICAL ARTICLES

*H-Iron: Competition for the Blast Furnace? ..	71
*Avoid Weld Defects in Stabilized Stainless ..	76
*Joining Stampings: Which Method for You? ..	80
*New Pump House Slakes Steel Mill Thirst ..	84
Automatic Scale Controls Baler Feed ..	86
Technical Briefs ..	96

### MARKETS & PRICES

*The Iron Age Summary—Steel Outlook ..	129
Steel Products Markets ..	130
Comparison of Prices ..	131
Iron and Steel Scrap Markets ..	132
Nonferrous Markets ..	136
Steel Prices ..	139

### REGULAR DEPARTMENTS

Dates to Remember ..	13
Free Literature ..	88
New Equipment ..	118

INDEX TO ADVERTISERS ..	156
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### NEWS DEVELOPMENTS

#### HOW STEEL STRIKE HIT METALWORKING P. 31

IRON AGE survey shows some steel-consuming industries could weather 60-90 day walkout. But others will be hit almost immediately. Government intervention seen after 30 days, if strike lasts that long.

#### ADHESIVES ARE MOVING INTO THE BIG TIME P. 36

Use of adhesives for metal bonding is gaining popularity rapidly. Key to growth of this method is flexibility—large number of attributes and physical characteristics which can be obtained. Biggest gains for joining dissimilar metals.

#### MAINTENANCE LABOR COSTS CAN BE CUT P. 37

Labor is the big variable expense item in the maintenance department. Many companies not applying job analysis methods in this area are losing out on a sure bet. Good time-keeping systems are necessary for determining these costs.

#### WHAT'S THE SECOND HALF FORGING OUTLOOK? P. 38

In spite of poor sales to automotive and farm implement industries, most



forging companies are looking for a booming second half. A steel strike could leave serious backlogs if it's extended for any length of time.



◀ **THESE CHUNKS** of H-Iron, produced by an efficient new hydrogen-reduction technique, symbolize a new and important process in the steel-making picture. See story (briefed below) on P. 71. (Hydrocarbon Research Inc. photo.)

## GOVERNORS DENOUNCE HIGH-POWERED CARS

P. 48

Too much emphasis on power, not enough on safety, state executives say. Industry claims it is not embroiled in a power race at its own choosing; the public wants bigger cars. Stock car races and endurance performance publicity are factors.

## FEATURE ARTICLES

### H-IRON: COMPETITION FOR THE BLAST FURNACE?

P. 71

The H-Iron process directly reduces iron ore fines with hydrogen—efficiently and cheaply. Almost every sizable U. S. steel producer is interested. Not an outright substitute for the blast furnace, it's bound to give some of the older steelmaking techniques stiff competition. End product—metallic iron—suits both open-hearth, electric furnaces.

### AVOID WELD DEFECTS IN STABILIZED STAINLESS

P. 76

Type 347 is normally considered one of the more weldable grades of stainless steel. But some fabricators have trouble with cracking both in weld deposits and adjacent heat affected zones. Here's one explanation, and some practical shop tips to help better odds against cracks in welding columbium-stabilized stainless.

### TOOL GRINDER HOLDS TOLERANCES TO MILLIONTHS

P. 79

Tolerances to millionths of an inch are hardly an everyday shop problem. Timken Roller Bearing, however, is turning out commercial quantities of tapered roller bearings within 0.000075-in. accuracies. Here's how they achieve the superfine grinding needed to produce master gages.

### JOINING STAMPINGS: WHICH METHOD'S BEST FOR YOU?

P. 80

Stampings are usually joined together or to other parts to make an assembled product. There are about 15 principal joining methods. Here's help to guide you in making the right choice. You'll find tips on riveting, brazing, welding, other techniques. Sketches point up the text, serve as visual aids.

### NEW PUMP HOUSE SLAKES STEEL MILL THIRST

P. 84

It takes water, millions of gallons of it, to turn out steel ingots and mill products. It doesn't show up in the final specs, but it's as vital as scrap or ore. It's a major reason why most steel plants set up shop alongside rivers. Weirton Steel completed its most recent pump-house-facilities expansion only last year. Here's what was done.

## MARKETS AND PRICES

### GOVERNMENT TAKES ON GM IN ANTITRUST SUIT

P. 35

GM is charged with conspiring to monopolize bus industry. On GM's side, H. H. Curtice contends that the company's dominance of the field is result only of superior products. It will take years before a decision.

### CANADIAN MILLS EXPAND TO MEET DEMAND

P. 40

Straining to meet growing metal needs, Canadians enlarge facilities, employ new techniques, and develop new ore deposits. Railroads, uranium mines and St. Lawrence Seaway Project are included among the consumers.

### GILSONITE OFFERS NEW FUEL SOURCE

P. 42

A refinery and processing plant in Colorado, scheduled for completion next spring, will produce gasoline, coke and fuel oil at prices competitive with petroleum products. The aluminum industry and western autoists are best sales prospects.

### CONSTRUCTION SPENDING WILL SPUR FARWEST BOOM

P. 57

Proposed six-year, \$6 billion public works program in Calif. certain to benefit metalworking plants there and across the nation. West Coast firms just won't be able to supply all needs despite planned expansions.

### STEEL STRIKE EFFECTS WILL LINGER ALL YEAR

P. 129

Even an early end of steel strike would leave many consumers out on the limb. It takes a while for mills to step up production. And even longer to get scrambled order books back into working order.

## NEXT WEEK:

### THERE'S BIG BUSINESS IN ELECTRIC POWER

Metalworking will have a big share in power industry's expansion plans. Some authorities believe \$75 billion will be spent in the next 20 years in expanding the generation and transmission of electric power.



There's more in this barrel for you...



James E. Pratt, left, Socony Mobil engineer, obtains performance data on hydraulic system at an aluminum extrusion plant.

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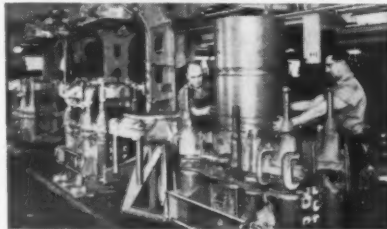
**Leader in automation for the foundry**

July 12, 1956

**TWO OTHER IMPORTANT REASONS  
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# **The Steel Strike and Ryerson Steel Service**

We hope the steel strike will be settled by the time you read this page. Every day of lost production has meant a loss of over 300,000 tons of steel, according to current estimates.

What about Ryerson stocks during this emergency? For the present our inventories of high quality carbon, alloy and stainless steels are large and varied—adequate to fill orders for warehouse quantities of most all kinds, shapes and sizes.

So we undoubtedly will be able to help you. Especially since our experienced steel men can often suggest practical alternates or draw on one of our 16 other plants if by any chance your needs are not available locally.

As always, we will fill orders as promptly as possible, at our regular prices. So continue to contact your nearby Ryerson plant for your steel requirements and we will do our best to take good care of you.

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Indexed in the Industrial Arts Index

and the Engineering Index.



## EDITORIAL

### Why Is There a Steel Strike?

♦ IF YOU EXPECT pious platitudes in this piece, skip it. You won't find them. But you may find some ideas on why steel management and labor are locked in what looks like a pretty grim battle.

Steel firms didn't want this strike any more than did union officials. It is ridiculous to think that they did. The workers didn't want a shutdown. Nor did steel customers want their flow of metal cut off. Eisenhower lieutenants didn't favor a walkout either.

If all this is true—then why is there a strike that may last weeks, cause bitterness, ruin well-laid plans and produce steel shortages for months on end? The reasons are not too hard to find.

There was no cloak and dagger deal or big time production in this picture. Nor is it true that the whole thing was staged, with someone blowing the works at the last minute. Nothing so exciting and dramatic happened.

The union chiefs thought that with a business boom still very much alive the industry would cave in at the last moment. These fellows also thought that during an election year the steel people would be afraid to take a strike. Others thought that too.

The steel presidents—and their negotiators—thought and acted quite differently. They held fast without much if any change from the very first. They believed they had a well thought out and fair package. They were flabbergasted when the union gave it the bronx cheer.

The steel side may have misjudged the union's militancy. Maybe they violated a human law; they never gave their union friend a chance to get off the hook until late in the negotiations.

But union chief Dave McDonald assumed that the steel negotiators were kidding when they insisted that the industry would hold fast for a package it considered fair and non-inflationary. That may be why he didn't break open his counter-offer package until furnaces were being banked.

When the union did make its offer the cost staggered even the most cooperative people in the steel group. By then it was too big and too late.

Someone goofed. And it wasn't the steel firms this time.

*Tom Campbell*

EDITOR-IN-CHIEF

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**BEAUTY** that cannot be duplicated in elegance or endurance. Is reason, too, why more Stainless Steel will be used this year than ever before.



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Sharon Stainless is actually all colors at one time. For example, a strip of stainless steel, used as a divider between two colors, catches reflects and blends both colors in a rich, eye-pleasing harmony.

And, Sharon Stainless Steel is tough and rugged — an outdoor metal that shrugs off flying stones, road abrasion and weather wear with equal ease.

No other metal has both these desirable traits. That's why discerning automotive designers are adding more Sharon Stainless Steel to each succeeding model.

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dear editor:

letters from readers

### Executive Training

Sir:

Would like you to know that I truly enjoy your weekly editorials and June 21 editorial, "What Price Executive Training," was of particular interest. *J. W. Frasor, Manager of Sales, Northwestern Steel & Wire Co., Sterling, Ill.*

### Emotional Problem

Sir:

I was pleased to see your editorial in the May 24 '56 issue, "Are We Going Soft?" When business becomes aware of this problem of emotional stability and meets it head on, the final profits will be stupendous. This is a challenge to management that can be of great benefit to all civilization. *G. C. L., Cincinnati, Ohio.*

### The Kitchen Sink

Sir:

I have seen your editorial, "Everything and the Kitchen Sink" (June 7 issue).

Perhaps I am "a voice crying in the wilderness" but at least I have been crying from bliss to express my opinion to some influential person on the steel negotiations.

The spiral of inflation is gathering a momentum which can only lead to disaster and a catastrophic depression unless it is checked.

A very dear friend of mine lived in Germany at the time when a barrel of reichmarks would buy a pound of coffee and a loaf of bread. The last barrier, in my humble opinion, would be the present steel negotiations.

If steel gives in, God help the small business man such as myself. *B. T. Moore, President, Linahan Casket Co., Inc., Mount Vernon, N. Y.*

July 12, 1956

### Commercial Titanium

Sir:

Would you please forward to me two copies of the article "Will Titanium Ever Go Commercial"? We are vitally interested in the subject of Titanium and can make good use of the information. *H. Millar, Metallurgist, Briles Mfg., El Segundo, Calif.*



Melting Titanium Sponge

Sir:

If available, we would appreciate receiving three copies of the article, "Will Titanium Ever Go Commercial" published in the June 7 issue of THE IRON AGE, *C. E. Roberts, Manager of Sales, Alloy Steel Div., Republic Steel Corp., Massillon, Ohio.*

### Die Design

Sir:

I have read with interest the article, "Design Dies Today—Start Stamping Tomorrow," which appears in the April 1956 issue (vol. 177, No. 16) of your magazine.

I would like your permission to reproduce a limited number of copies of this excellent article for distribution to interested personnel in the General Electric Company. *J. Uberbacher, Supervisor, General Electric Co., Cincinnati, Ohio.*



**DON'T GIVE ME THAT!**

### YOU CAN'T BEAT GARRETT SERVICE

I'm not a wise guy, but I do know about the service these Garrett plants give you. Seems hard to believe. Those fellows bend over backwards to help you out in an emergency. And their regular service means you always get deliveries when promised ... sometimes before.

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## fatigue cracks

### The Big Story

We're trying to be modest, but our psychiatrist keeps prodding us to get it out of our system. So, instead of batting the wife and kids around this week, we're going to talk about your f.f.j.'s reputation for covering steel labor.

Top metalworking executives have known it for years, but the men in the shop are catching on, too. As usual, IRON AGE district editors were swamped with calls for the latest on steel labor negotiations. And some of them obviously were from anxious men in the mills.

Just to give you an idea of the kind of job IRON AGE editors are doing, here's what readers got for their five dollars this year—so far:

#### Early Lowdown

Before negotiations started, we carried two major preliminary articles, one by J. B. Delaney, News-Markets editor, detailing behind-the-scenes moves by steel labor as



it got set for major negotiations; the other by Editor-in-Chief Tom Campbell giving the low-down on steel management's negotiating team.

Once contract talks got underway, a two-man team of Tom Campbell and G. G. Carr, eastern regional editor, sat in on press conferences, and buttonholed union and company negotiators at New York's Roosevelt Hotel to get

by William M. Coffey

significant bits of information for IRON AGE readers. The wear and tear on buttonholes was ghastly, not to mention the torn fingernails of our hard-working reporters.

After editing and neat wrapping up by our Philadelphia news staff, IRON AGE readers, week by week, got their usual newsy and interpretative coverage of the year's biggest story for metalworking.

Was it up to standard? Most of the nation's big newspapers, magazines, radio and television stations, thought so. They quoted THE IRON AGE extensively, as in the past, to supplement their own coverage.

Memo to maw and the kids: Relax.

#### Puzzlers

The snail-pole puzzler fooled everybody except Don Hartman, Solar Steel Corp.; W. C. Cook, W. C. Nabors Co.; A. C. Willis, Temco Aircraft Co.; Glen R. Law, Federal Power Commission; C. W. McKinley, AC Spark Plug Div.; G. DeGrado and T. Albano; Ole Darcey; Marilyn Crawford, Crucible Steel; and Fletcher Plumley, Reynolds Metals Co.

#### New Puzzler

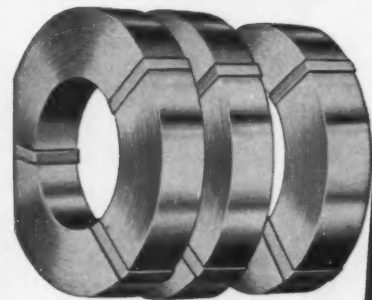
A man lived on the tenth floor of an apartment house having self-service elevators. Each morning on his way to work he would enter the elevator on the 10th floor and exit on the 1st floor.

Each evening on his way home from work he would enter the elevator on the 1st floor and exit on the 9th floor. He would use the stairway between the 9th and 10th floors to reach his apartment.

Why did he always get off on the 9th floor?

Many thanks to Mr. H. Benington, Consolidated Western Steel, for this little problem in logic. In logic?

## Alloy Strip in Precision Sizes meets New Design Needs...



From 0.0005 in. to 0.040 in. thick and 0.090 to 6 in. wide, these alloys are available as special-tolerance strip:

**Beryllium Copper**  
**Phosphor Bronze**  
**Nickel Silver**  
**Brass**  
**Chromium Copper**  
**Stainless 17-7PH**  
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#### WAREHOUSES

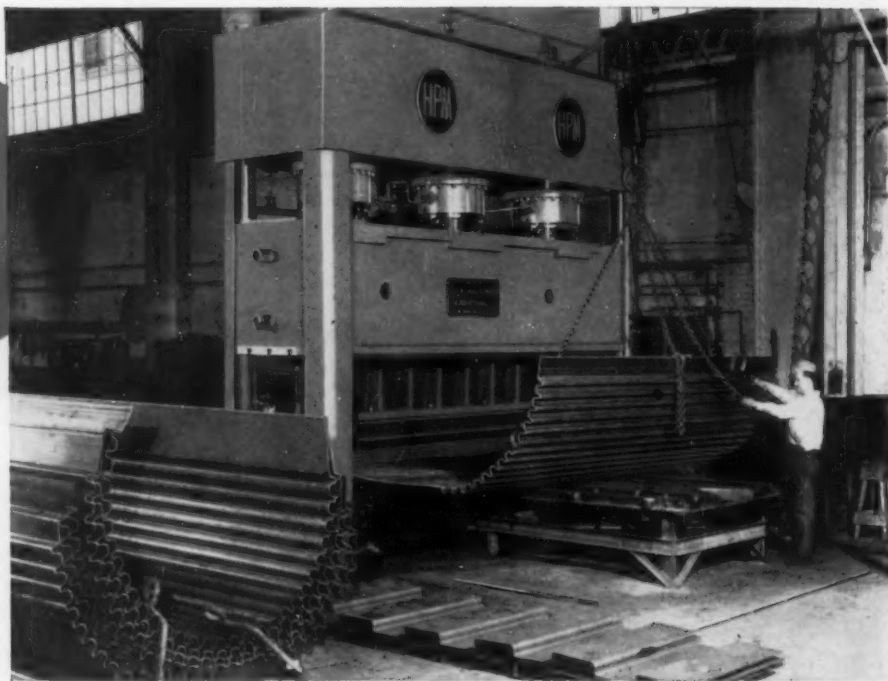
New York  
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# Permanent Wave for 1/2" Plate

PLATE SHOWN  
ACTUAL SIZE



## Special H-P-M Press Corrugates Heavy Steel Plate Annealing Boxes

For rugged, heavy duty jobs—special metal forming requirements of all types—manufacturers like National Annealing Box Co., Washington, Pa., rely on H-P-Ms. This special frame, long bed, 1500 ton H-P-M will handle steel plate up to 180" wide. Half inch plate (as illustrated) is formed into cylindrical or flat corrugated sheets which form the walls and covers of annealing boxes. These corrugations are 2" deep, well rounded for strength, formed one at a time.

For your toughest jobs choose H-P-Ms—standard and special Fastraverse, self-contained presses are easily adapted to countless applications. Call your H-P-M field engineer at the planning stage. Here's worthwhile experience for you!

*Write Today!*

METAL WORKING DIVISION  
**THE HYDRAULIC  
PRESS MFG. CO.**

Mount Gilead, Ohio, U.S.A.

**HPM**



## dates to remember

### JULY

**Truck-Trailer Manufacturers Assn., Inc.**—Summer meeting, July 19-20, Edgewater Beach Hotel, Chicago. Society headquarters, 710 Albee Bldg., Washington, D. C.

**National Tools & Die Manufacturers Assn.**—Summer meeting, July 25-28, Estes Park, Colo. Society headquarters, 907 Public Square Bldg., Cleveland.

**Cutting Tool Manufacturers Assn.**—Quarterly meeting, July 25, Lochmoor Country Club, Detroit. Society headquarters, 416 Penobscot Bldg., Detroit.

### EXPOSITIONS

**Western Packaging and Materials Handling Exposition**, July 10-12, Los Angeles.

**Assn. of Iron & Steel Engineers**, Sept. 25-28, Cleveland.

**Metal Show**—Oct. 5-12, Cleveland.

### AUGUST

**Society of Automotive Engineers, Inc.**—National west coast meeting, Aug. 6-8, Mark Hopkins Hotel, San Francisco. Society headquarters, 29 W. 39th St., N. Y.

**National Screw Machine Products Assn.**—Annual national sales conference, Aug. 7-8, Wade Park Manor Hotel, Cleveland. Society headquarters, NSMPA Bldg., Cleveland.

**Western Electronic Show and Convention**—Aug. 21-24, Pan Pacific Auditorium and Ambassador Hotel. Information, WESCON, 344 N. LaBrea Ave., Los Angeles.

### SEPTEMBER

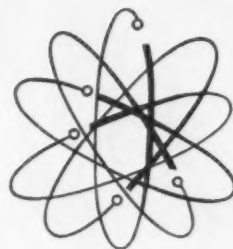
**Metal Powder Assn.**—Fall meeting, Sept. 7-9, Homestead, Hot Springs, Va., Society headquarters, 420 Lexington Ave., N. Y.

**American Institute of Chemical Engineers**—Fall meeting, Sept. 9-12, William Penn Hotel, Pittsburgh. Society headquarters, 120 E. 41st, N. Y.

# RESEARCH

is a dynamic development  
in forward-looking

## NORTH CAROLINA



UNIVERSITY OF  
NORTH CAROLINA



DUKE UNIVERSITY



NORTH CAROLINA  
STATE COLLEGE

Ideas for tomorrow's products — and research leading to improvements in today's products and processes — are among the tangible benefits available to industry in North Carolina.

Three famed educational institutions combine to form a research center that is attracting top scientists and graduating increasing numbers of science and engineering students. Separately and cooperatively, these great schools carry on major projects for industry and government.

North Carolina research equipment and facilities include the first independently-owned, unclassified nuclear reactor. Scientists and research engineers at the universities are available to consult with industry. Trained personnel is provided by increasing numbers of students majoring in the modern sciences.

Here, in this uncrowded area and unhurried atmosphere, already distinguished for its research projects, laboratories are welcomed. More companies are invited, too, to share the present research facilities and other important advantages of plant locations in North Carolina. Write in confidence for additional information.



**FREE  
BROCHURE**  
"Industrial  
Location  
Factors"—  
Send for a  
copy today.

Department of  
**CONSERVATION AND DEVELOPMENT**  
Raleigh 11, North Carolina  
William P. Saunders, Director

**NORTH CAROLINA**  
YEAR 'ROUND MID-SOUTH

## expanding mill standardizes on



To meet ever-increasing demands for specialized steel, an eastern mill has completed an extensive expansion program consisting of a new reversing cold mill and two auxiliary lines. Significantly, Allis-Chalmers control is utilized in all three operations.

Progressive mills are taking advantage of Allis-Chalmers experience in engineering, building and applying steel mill control — control that provides smooth, precision performance — control that affords maximum production and top quality with a minimum of outage time and maintenance. Get all the facts about Allis-Chalmers mill control. See your A-C representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.



### PICKLING LINE

The Allis-Chalmers control on this line provides an exceptionally wide speed range of more than 15 to 1. Power for the line comes from three separate m-g sets employing magnetic amplifiers for quick response. Complete synchronization between entry, processing and delivery sections permits continuous mill operation.



### ANNEALING LINE

This control features power-type magnetic amplifier regulation for accurate control and low maintenance. Variable voltage power is obtained from a six-machine m-g set. Speed regulation of .5% assures constant strip speed and a resulting uniformity of high quality steel. Open-type control boards utilize Allis-Chalmers components especially designed for mill operation.



# ALLIS-

THE IRON AGE

# ALLIS-CHALMERS

## CONTROL



### REVERSING MILL

Critical percentage reduction of specialized steels rolled with this mill requires exacting control. Main mill voltage and reel tension circuits utilize new high-gain magnetic amplifier control. Because the magnetic amplifier is a static device, maintenance and necessity of replacement parts are reduced to a minimum. Fast arc-centering blowout on the dc contactors, shown on the control board, extends contact and chute life. Exceptional interchangeability of contactor and relay parts affords maximum convenience and economy.



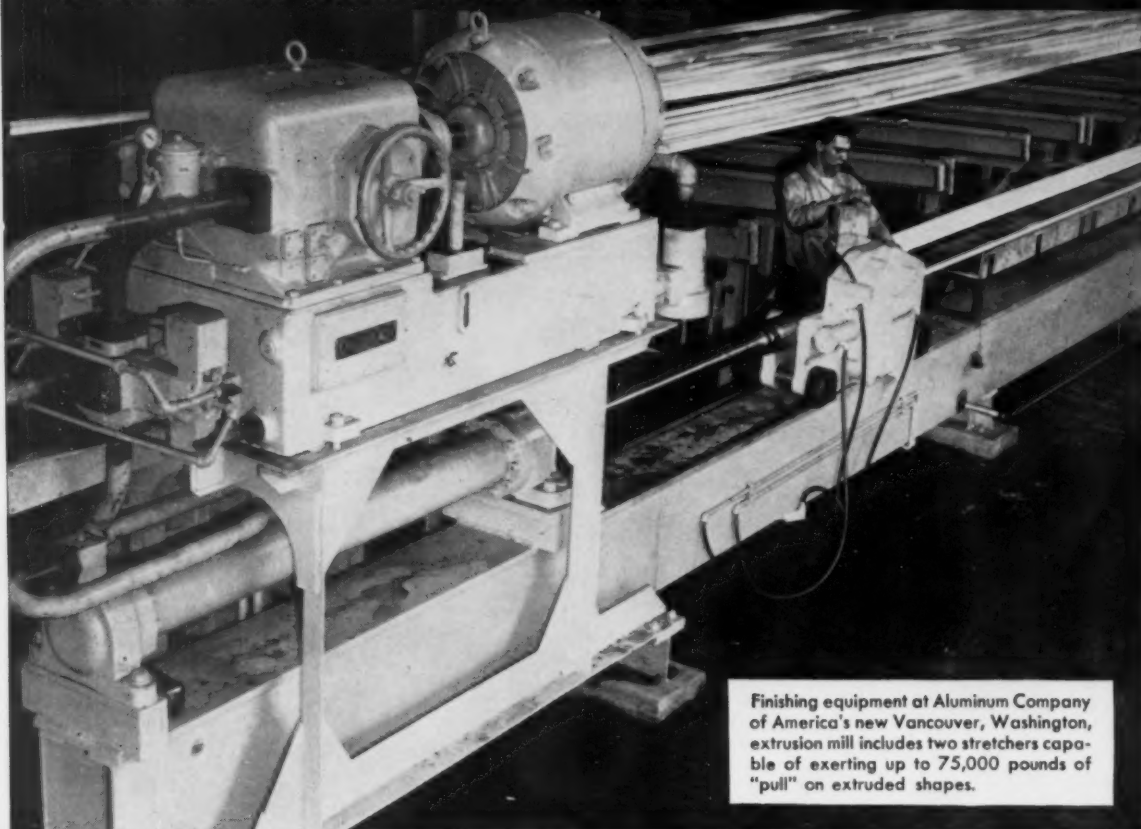
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# CHALMERS

July 12, 1956

LEADERS IN INDUSTRIAL SAFETY:

ALCOA



Finishing equipment at Aluminum Company of America's new Vancouver, Washington, extrusion mill includes two stretchers capable of exerting up to 75,000 pounds of "pull" on extruded shapes.

One of the things that impresses visitors to Alcoa is the strong emphasis on safety. It isn't surprising, then, to find fire-resistant Pydraul used in Alcoa hydraulic equipment...eliminating a potential source of fire.

## FIRE-RESISTANT PYDRAUL F-9 CHANGES FIRE ZONES TO SAFETY ZONES

275 million hours of actual in-use operation—without a single hydraulic fire—proves the safety and dependability of fire-resistant Pydraul hydraulic fluid.

But Pydraul gives you more than safety. You can be sure of long equipment life with low maintenance... because Pydraul lubricates like a premium petroleum oil. You'll save money on fluid consumption, too! Pydraul is reclaimable—you can return spillage to the system, use it again and again.

Make a quick check of your hydraulic equipment... calculate your fire risk if it's close to hot metal, electrical contacts, open flame or other heat sources. Then talk to a Monsanto representative. He will show you how easy it is to convert to Pydraul... giving you a future of positive safety from hydraulic fires... at low cost per year.

### PYDRAUL MEANS:

Fire Resistance  
Excellent Lubricity  
High Stability

No Corrosion  
Re-use, Again and Again

Write now for new booklet, "PYDRAUL F-9." Organic Chemicals Division, MONSANTO CHEMICAL COMPANY, Dept. PYD-1, St. Louis, 1, Mo.

**PYDRAUL F-9**—First and Only Hydraulic Fluid Listed by Underwriters' Lab.

On May 31, 1955, Pydraul F-9 became the first fire-resistant hydraulic fluid listed by Underwriters' Laboratories. From the Laboratories' Service Card: "The fire hazard of (PYDRAUL) is rated 2 to 3 in accordance with Underwriters' Laboratories, Inc.'s Standard of Classification in which Ether rates 100, Gasoline rates 90-100, Alcohol (ethyl) rates 60-70, Kerosene (100° F. flash) rates 30-40, and Paraffin oil rates 10-20." See Underwriters' Laboratories, Inc.'s guide No. 540 18, File MH6049.

PYDRAUL: Reg. U. S. Pat. Off.



MONSANTO

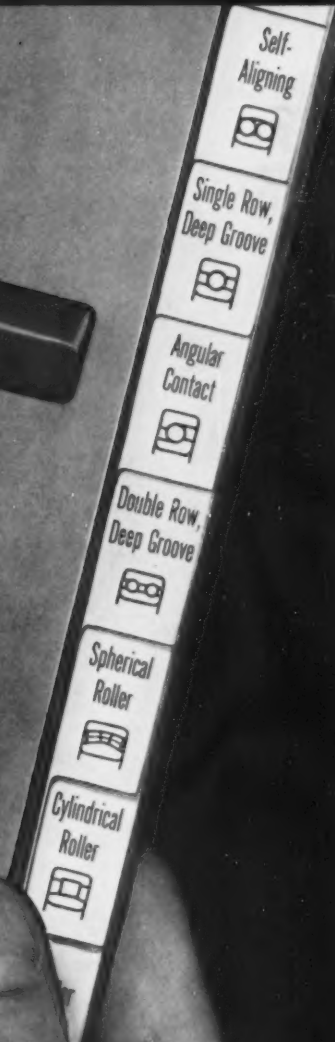
WHERE CREATIVE CHEMISTRY WORKS WONDERS FOR YOU



# SKF

## General Catalog

this is a  
wise man's  
thumb



The Design Engineer wants facts about bearings and, wisely, he starts his search in a catalog that covers both ball *and* roller bearings — the **SKF** catalog.

**He knows some other things . . .**

- that **SKF**'s field engineering staff, second to none in breadth of experience, has a man on call in *his* area . . .
- that **SKF**'s home office engineering staff has men who specialize on bearing applications in *his* industry . . .
- that **SKF**'s expanded laboratory can, if needed, perform special experimental work on *his* problem . . .

**SKF** — serving *all* industries — invests most heavily in bearing application service. By putting the right bearing in the right place, this service can help your product gain a competitive edge—through lower cost, longer life, reduced maintenance, and improved performance.

**SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.**  
—manufacturers of **SKF** and HESS-BRIGHT® bearings.



# SKF®

**BALL AND ROLLER BEARINGS**

© 1955 **SKF** Industries, Inc.

Bearings  
the wise man  
buys \*



#### SKF EXCLUSIVE

For heavy duty service, the wise designer specifies this improved (Type "C") *Spherical Roller Bearing*. Only SKF makes it. Size for size, it provides up to 50% more capacity than other spherical roller bearings — vastly longer life for given radial and thrust load conditions.

#### SKF THRUST LOAD CARRIER

SKF's *Spherical Roller Thrust Bearing* is the wise designer's answer where the problem is to support heavy thrust loads, or combined loads which are predominantly thrust, on vertical or horizontal shafts. The only roller thrust bearing that is inherently self-aligning.



#### SKF STEELWORKER

For roll necks (and many other applications, too) the wise designer specifies SKF *Multi-Row Cylindrical Roller Bearing*, a design which provides the utmost in radial rigidity. In the larger sizes, SKF's hydraulic system makes mounting and dismounting easy.

#### SKF PROVED AND IMPROVED

The wise designer has long specified the proven SKF *Triple-Seal "SAF" Pillow Block*. The "SAF" is easy to install and inspect; effectively seals out dirt while retaining lubricant; bearing self-aligns. Now, to provide increased life and capacity, SKF makes the "SAF" available with the improved (Type "C") *Spherical Roller Bearing*. As a further improvement, the "SAF" can now be obtained with either cast iron or steel housing.



Let nearby SKF Field Engineers help you put the right bearing in the right place in your designs.  
**SKF INDUSTRIES, INC.**, PHILADELPHIA 32, PA. —  
manufacturers of SKF and HESS-BRIGHT® bearings.

7601 A  
FORM 411

# SKF®

**BALL AND ROLLER BEARINGS**

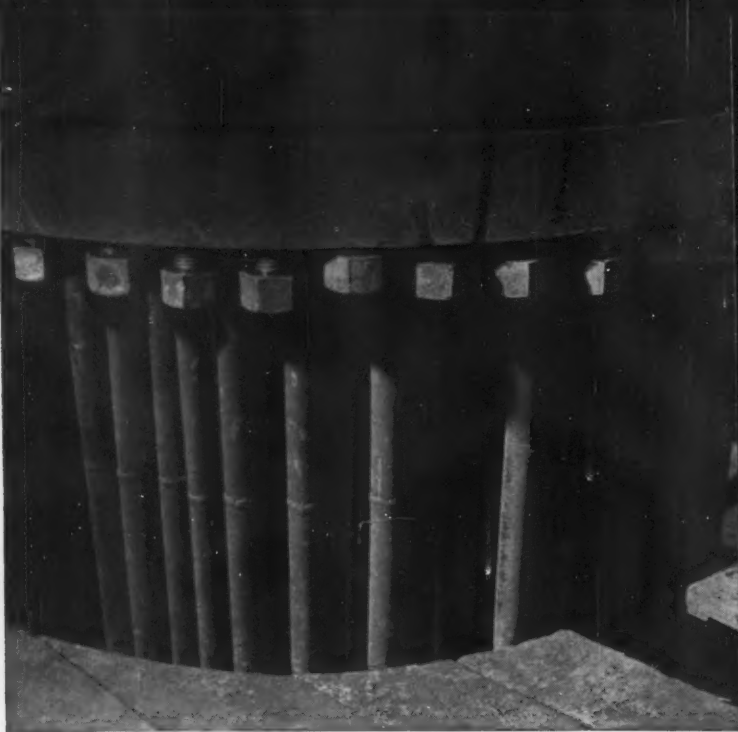
© 1955 SKF Industries, Inc.



See idea for design engineers on other side.



**FOR SCUFF-RESISTANT BEAUTY.** This Sunroc water cooler has, as standard equipment, a Stainless Steel kick plate for protection against scuffing and corrosion when floors are mopped. The deep drawn top is also made from Stainless. It's bright and inviting, and easy to clean.



**FOR LONG, HARD SERVICE.** Some of the Stainless Steel tubes in this bundle are 20 years old, despite the fact that they have been in continual service in a thermal cracking unit at a major southwestern oil refinery. Even though some of them have been lengthened by heliarc welding, they still retain their ability to handle corrosive products.

# NOTHING *can equal* *Stainless Steel*



**FOR SANITATION.** This is a Stainless Steel rotary washer at a baby food plant of Gerber Products Company. Stainless Steel was used because of its great corrosion resistance, because it will not contaminate the food products, because it is so very easy to clean. Gerber's uses a lot of Stainless Steel processing equipment—including peelers, bins, steamers, holding tanks and filling machines.

• No other design material can match Stainless Steel in its *combination* of desirable properties: corrosion resistance, strength and hardness, beauty, cleanability and easy fabrication. When seeking a source of supply, remember that United States Steel offers the widest range of types, finishes and sizes available in the United States.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND  
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH  
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.  
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

## USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS  
PIPE • TUBES • WIRE • SPECIAL SECTIONS



UNITED STATES STEEL



**TRACK PINS AND DEAD AXLE SHAFT** are subject to heavy stress and strain when the Oliver "OC-18" Industrial Crawler Tractor goes into action. Republic Cold Finished Steels at these vital points absorb shocks and wear of the most rugged service . . . help maintain Oliver's reputation for dependable performance plus economy of operation. Inset shows "OC-18" hard at work on Ohio Turnpike construction.



**GEARS TRANSMIT POWER** with maximum dependability when designed to make full use of Republic Alloy Steel's excellent physical properties. Formulated to provide great strength, toughness and wear resistance, Republic Alloy Steels allow bulk-free designs requiring less power to start and stop. Republic Metallurgists can help you apply these steels to your product. Mail coupon for full information.

**LARGE TONNAGE, LOW WEIGHT** are cost-saving features of this new Stainless Steel Volume Van. High strength-to-weight ratio of stainless allows thinner lighter sections with no loss of strength or safety. Result: 35% extra payload capacity. Republic ENDURO® Stainless Steel also offers exceptional abrasion and corrosion-resistance — best choice for long-term beauty plus low maintenance.



# REPUBLIC



*World's Widest Range of Standard Steels*



IN TRACK PINS AND DEAD AXLE SHAFT

# Republic Cold Finished Steel transmits 17 tons of driving power

When the mighty Oliver "OC-18" Crawler Tractor leans into a clay bank under full power, king-size forces are exerted against the dead axle shaft and track pins. That's why the Oliver Corporation specifies Republic Cold Finished Steel for these vital parts in the 21-ton giant of their line.

Enormous push and pull strains and shocks are normal in the rugged service the "OC-18" is built to deliver. To protect final drive assembly from undue abuse, a four-inch Republic Cold Finished Alloy Steel Bar is used for the dead axle shaft. Combining extremely high strength and toughness, plus outstanding abrasion and corrosion-resistance, Republic Alloy Bars are more than a match for the tremendous forces involved.

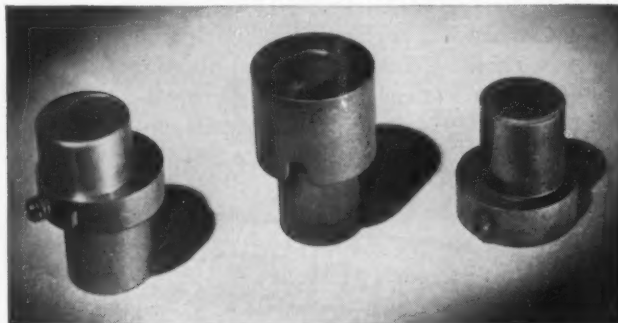
Equal dependability for "OC-18" track pins, is provided by Republic Cold Finished Carbon Corrected Steel. Years of service on other

Oliver models have proved this material exceptionally resistant to fatigue failure. In addition, maximum service life is assured by Republic's consistent quality . . . the basis for uniform surface hardness in each pin.

In countless other industrial applications, Republic Cold Finished Steel maintains superior standards of performance. Ultimate strength, yield point and hardness of any given steel analysis show marked improvement after cold drawing. Also, production economies can often be effected by taking advantage of the straightness, smooth surface, accurate size and excellent machinability of Republic Cold Finished Steel.

It will pay you to consider Republic Cold Finished Steel in terms of your production and application problems. Simply contact your local Republic Office or mail coupon for further information, today.

**UNIFORMLY STRONG IRON POWDER PARTS** are easier to achieve when you specify Republic Iron Powder. Its high green and sintered strength simplifies your processing and handling. Particle size and apparent density are carefully controlled. Uniform consistency is assured. Republic can help you determine suitability of your parts to iron powder production—or recommend other methods and materials.



# STEEL

*and Steel Products*

## REPUBLIC STEEL CORPORATION

Dept. C-2148

3104 East 45th Street • Cleveland 27, Ohio

Please send me further information on:

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| <input type="checkbox"/> Cold Finished Steels | <input type="checkbox"/> ENDURO Stainless Steels |
| <input type="checkbox"/> Alloy Steels         | <input type="checkbox"/> Iron Powder             |

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

# SERVALL IS ALL-

## The Rugged Hose for General

Here's the answer to your multiple-purpose hose needs. It's Hewitt-Robins Servall All-Service Hose. Servall is more rugged and long-lasting, yet it's light in weight and easy to handle.

For general applications such as water, mild chemicals, air, oil, gasoline, welding, etc., Servall provides unexcelled, economical service. Servall Hose has been designed to combine the quality features of several types of specialty hoses in such a way that it has many applications yet is moderate in cost.

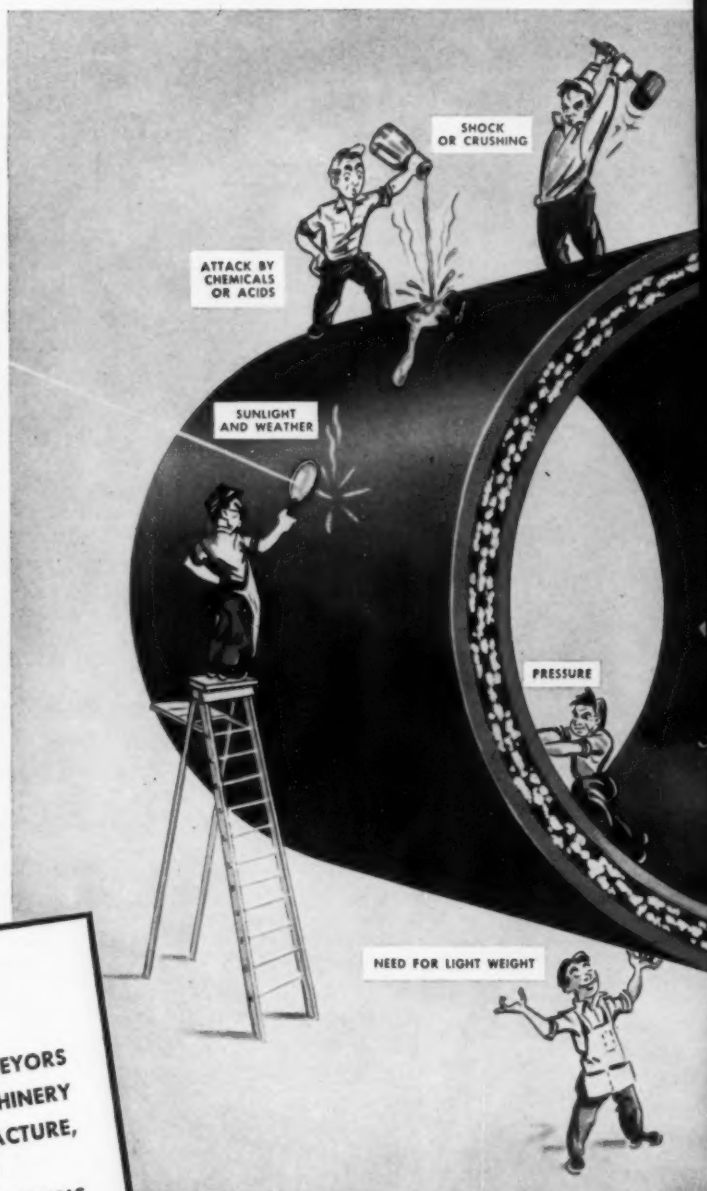
The *tube* is smooth, high-quality synthetic rubber blended to resist the injurious action of liquids and gases. The *carcass* is braided, high-tensile synthetic cord impregnated and imbedded in synthetic rubber to provide maximum strength with minimum bulk. The *cover* is long-wearing, tough synthetic to withstand gasoline, oil, weak organic acids and alkalis, to resist weathering, sun and abrasion.

Servall Hose is available in sizes from  $\frac{1}{4}$ " x 1 braid to  $1\frac{1}{2}$ " x 3 braid with maximum working pressures from 200 to 300 lbs. and in specified lengths or economical 500-foot bales.

Check the list of applications at the right to see how Hewitt-Robins Servall Hose fits your requirements. For complete information contact your local Hewitt-Robins industrial supply distributor or write for Bulletin S-101.

### INDUSTRIAL DIVISIONS PRODUCTS

INDUSTRIAL HOSE • VIBRATING CONVEYORS  
CONVEYOR BELTING • CONVEYOR MACHINERY  
VIBRATING SCREENS • DESIGN, MANUFACTURE,  
ENGINEERING AND ERECTION OF  
COMPLETE BULK MATERIALS HANDLING SYSTEMS  
"GLIDE RIDE" THE NEW MOVING SIDEWALK



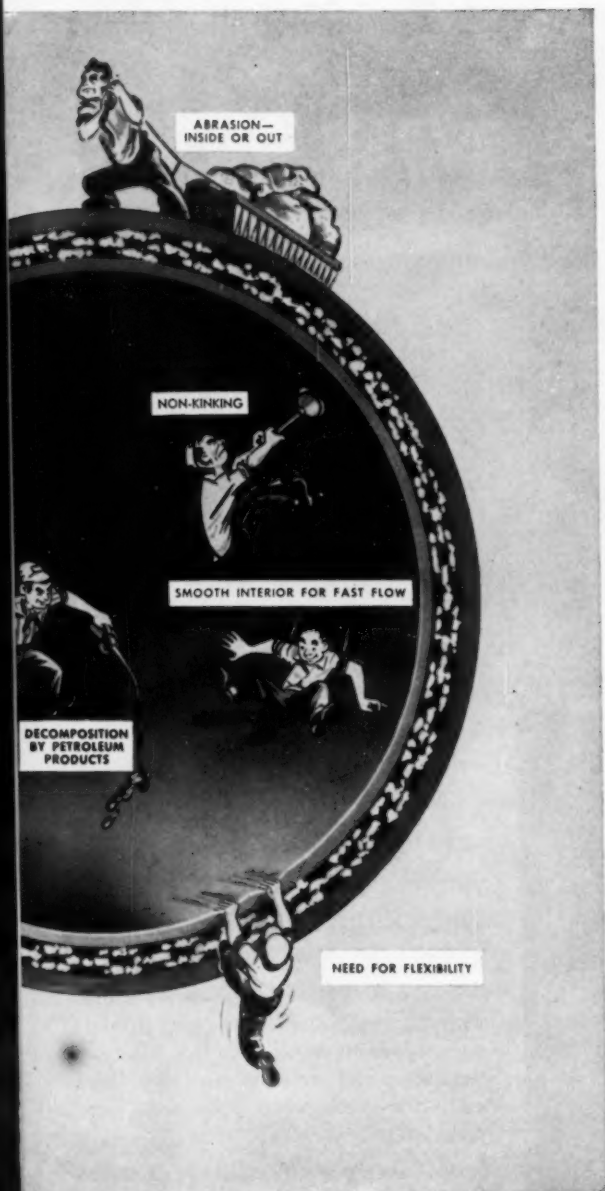
# HEWITT

INCORPORATED • EXECUTIVE

THE IRON AGE

# PURPOSE

## Service



### APPLICATIONS OF HEWITT-ROBINS SERVALL ALL-SERVICE HOSE



**WATER SERVICE**—For hot or cold water services under severe operating conditions in industrial and other heavy-duty applications. Assures maximum life and low maintenance cost.

**MILD CHEMICALS**—For weak, inorganic acids, alkalies, salt solutions, Ethyl, Methyl and other alcohols.

**AIR SERVICE**—For all types of air tools, air cleaning and general air service. Excels in air compressor service and general contracting work.

**LOW-PRESSURE SPRAY SERVICE**—For paint spray (not lacquer).

**OIL AND GASOLINE**—For intermittent oil and gasoline service (not static grounded), grease, kerosene and other petroleum derivatives.

**WELDING HOSE**—For heavy-duty single-line welding service with flame or ozone resistant cover.

FOR SERVICE AND INFORMATION  
ON BELTING AND HOSE  
CALL YOUR LOCAL HEWITT-ROBINS  
INDUSTRIAL SUPPLY DISTRIBUTOR  
LISTED IN THE "YELLOW PAGES"



# -ROBINS

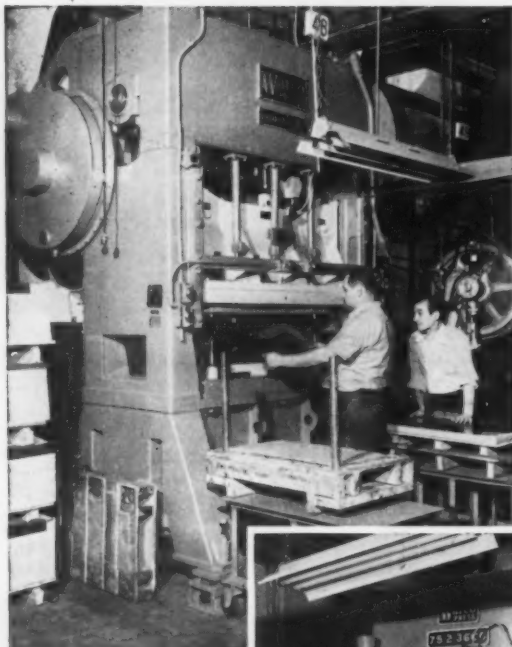
OFFICES: STAMFORD, CONN.

July 12, 1956

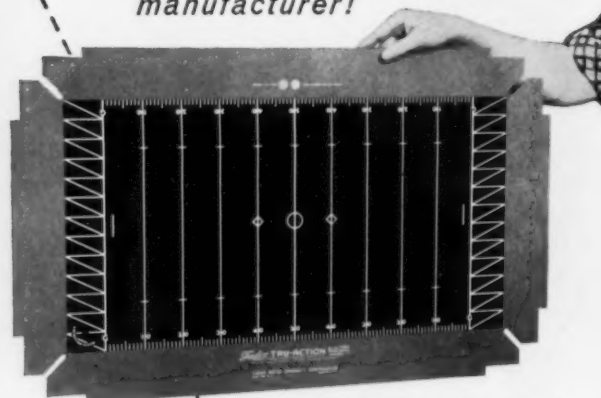
# "Warco's a winner!"



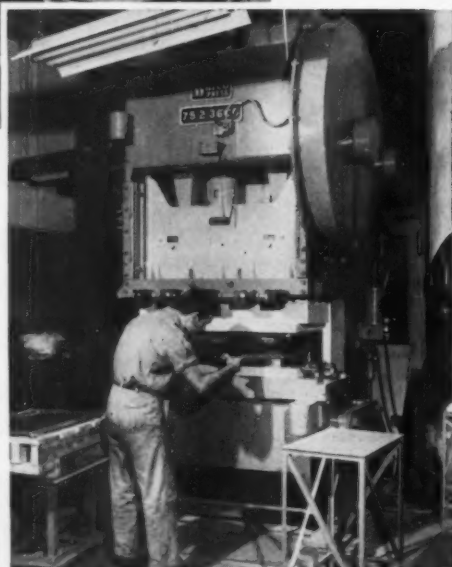
says leading metal game manufacturer!



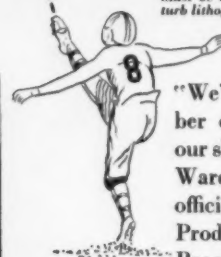
Press Foreman Andrew Harris watches as press operator Andrew Amodeo operates 100-ton Warco Crank Press.



Typical game stamping. Presswork must be accurate, clean and not disturb lithography.



Salvatore Cordero puts flanges on stamping with Warco 75-ton Crank Gap Press.



"We've tried quite a number of different presses in our shop—and in our books, Warco is a winner," say officials of the Tudor Metals Products Corporation of Brooklyn, N. Y., one of the nation's leading manufacturers of metal games.

"Clean and neat of design, they perform with businesslike efficiency, with a minimum of maintenance. We like what we have seen, and certainly must give them an inside track when considering new press equipment."

If you haven't as yet talked with a Warco user, why not let us put you in touch with one in your area. We know he'll convince you that Warco will win for you, too.



The Federal Machine and Welder Company

WARREN, OHIO

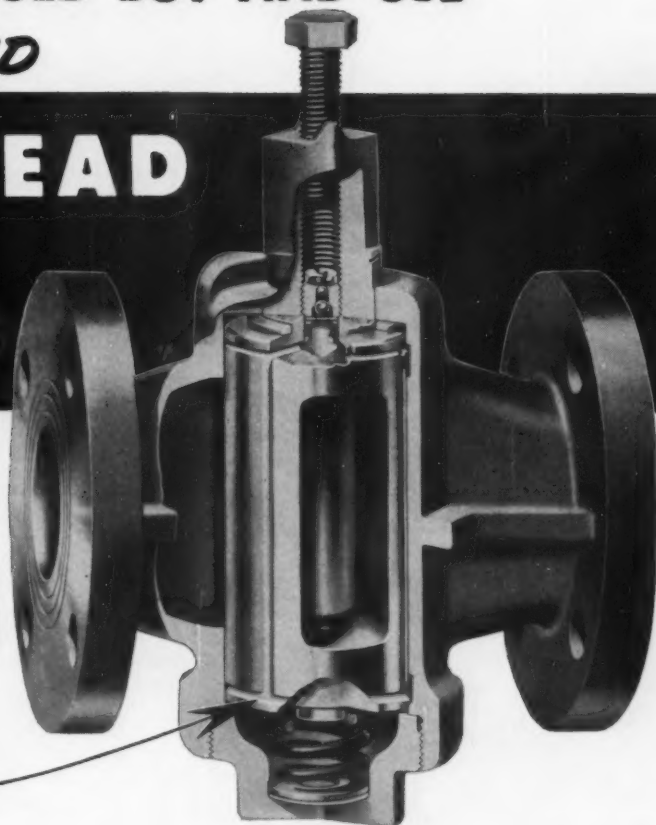
9061



# No. 5\* of 12 REASONS WHY YOU SHOULD BUY AND USE *LOW-PRICED*

## **HOMESTEAD** *Lubricated* **PLUG VALVES**

**\*SELF-FREEING  
PLUG  
PREVENTS  
STICKING**



Homestead's exclusive completely controlled lubricant system positively prevents sticking by its instant, piston-like movement of the plug downward at the start of each lubrication. Spring and line pressure return it to stem-sealed position.

This is only **one reason why you should buy and use low-priced HOMESTEAD LUBRICATED PLUG VALVES.**

### HERE ARE ALL TWELVE

1. Extra long valve life assured by very close tolerance between sealing surfaces.
2. Straight line fluid flow—streamlined ports—minimum resistance to flow—minimum pressure drop.
3. Triple head seal—two lubricant rings and reinforced Teflon stem seal prevent leakage.
4. Easy turning—plug floated on Teflon washer and reinforced Teflon ring.
5. Self-freeing plug prevents sticking.
6. Full-threaded screw prevents dirt being forced into lubricant system.
7. Quarter-turn fully opens or closes.
8. Reinforced Teflon stem seal—no cold flow—continuous, positive seal.
9. Seating surfaces protected in both open and closed positions.
10. High pressure lubricant system provides full lubricant seal around ports.
11. Leak-proof double ball and lubricant sealed check valve. No springs. No maintenance.
12. Two lubricants handle most services.

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MAIL COUPON TODAY

**HOMESTEAD**  
VALVE MANUFACTURING COMPANY  
*"Serving Since 1892"*

P. O. Box 23

Coraopolis, Pa.

Without obligation, send Reference Book 39—Section 5  
on HOMESTEAD LUBRICATED PLUG VALVES.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

July 12, 1956

23

## Ship fast

OVERNIGHT your shipment speeds from coast to coast on United's "Big Lift" DC-6As!

RADAR, exclusive on United's DC-6As, means faster, smoother flight, on-time dependability!

## Ship sure

SPECIAL TUG BAR on "Big Lift" Cargoliners makes for fast, sure handling of your heavy pieces!

TIE-DOWNS, strongest in any cargo plane, keep even the heaviest shipments secure!

## Ship United

RAF—Reserved Air Freight—guarantees you space dependability on all United equipment.

TELEMETER flashes your Airbill in advance of delivery, means faster pickup at destination.



### Examples of United's low Air Freight rates per 100 pounds\*

CHICAGO to CLEVELAND . . . . .	\$4.78
DENVER to OMAHA . . . . .	\$6.42
NEW YORK to CHICAGO . . . . .	\$7.50
SEATTLE to LOS ANGELES . . . . .	\$12.02
PHILADELPHIA to PORTLAND . . . . .	\$24.15
SAN FRANCISCO to BOSTON . . . . .	\$27.00

\*These are the rates for most commodities. They are often lower for larger shipments. Rates shown are for information only, are subject to change, and do not include the 3% federal tax on domestic shipments.



For service or information, call the nearest United Air Lines Representative. Write for free Air Freight booklet, Cargo Sales Division, Dept. AI-7, United Air Lines, 5959 S. Cicero Ave., Chicago 38.



## Caterpillar Tractor Co. speeds up parts handling with USS GERRARD STEEL STRAPPING

The use of Gerrard Round Steel Strapping has enabled Caterpillar Tractor Co. to turn out tighter, safer pallets and cartons of materials in far less time than was previously required. Caterpillar uses Gerrard Round Strapping for all types of reinforcing applications, from cartons of small parts to huge pallets of engine blocks.

Available in a wide range of sizes,

USS Gerrard Strapping, Round or Flat, is virtually tailored to every tying application, regardless of the shape or size of the pallet or crate.

Initially, the cost of Gerrard Round Steel Strapping is low—about 40% less than any other form of metal reinforcement. Moreover, it cuts materials handling time to fractions, and produces firmer, safer-to-handle, easier-to-stack packages.

Gerrard Strapping is quick and easy to use, and once bundles are strapped, they need no further inventorying. Pilferage is eliminated and damage is reduced to a minimum.

If you have a packaging-tying problem, why not give our engineers a crack at it? They could come up with just the right solution to benefit you and your customers.

### NEW CATALOG—HOT OFF THE PRESS!

36 pages of photographs, description, facts and figures on all USS GERRARD Steel Strapping and associated equipment.

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL CORPORATION  
GENERAL OFFICES: CHICAGO, ILLINOIS

**USS GERRARD**  
*Round and Flat* **STEEL STRAPPING**

UNITED STATES STEEL



— Send For This Catalog Now —

Gerrard Steel Strapping  
4711 South Richmond St., Chicago 32, Ill.

Please send me, free of charge, the new  
36-page GERRARD Blue Book of Packaging.

Name .....

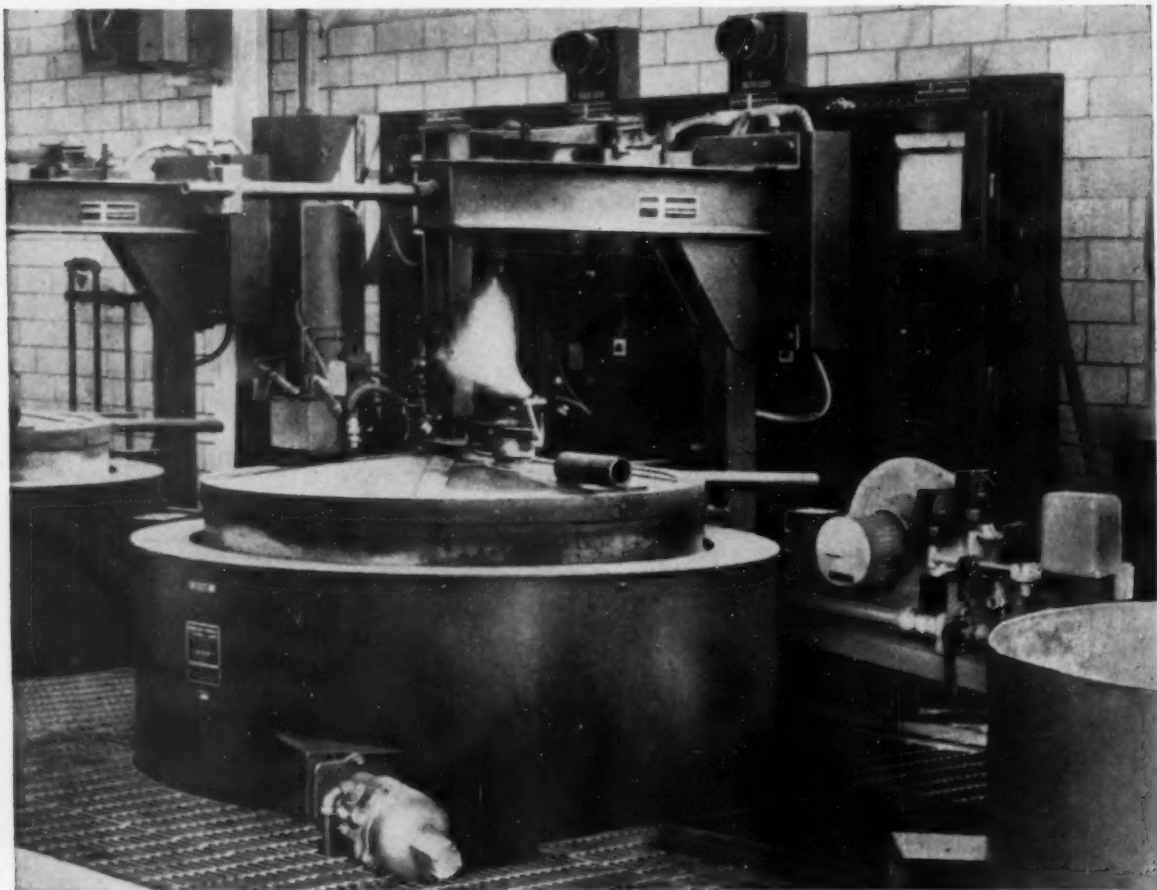
Company .....

Address .....

City ..... State .....

# A New Line of Gas Fired Homocarb Furnaces

Here for the first time is gas-fired equipment that gives you all the industry-proved advantages of the Homocarb® method with Microcarb® Atmosphere Control:



*Uniform product quality • High production rate • Low operating cost*

You get completely "packaged" equipment which includes Microcarb Atmosphere Control, a Safe-Start Burner Control Unit and the Homocarb furnace.

**1** Microcarb Atmosphere Control gives continuous, automatic regulation of carburizing atmosphere during the entire heat treating cycle.

**2** The Safe-Start Burner Control Unit is a "packaged" combustion control assembly with all operating and safety components mounted, wired and piped before shipment.

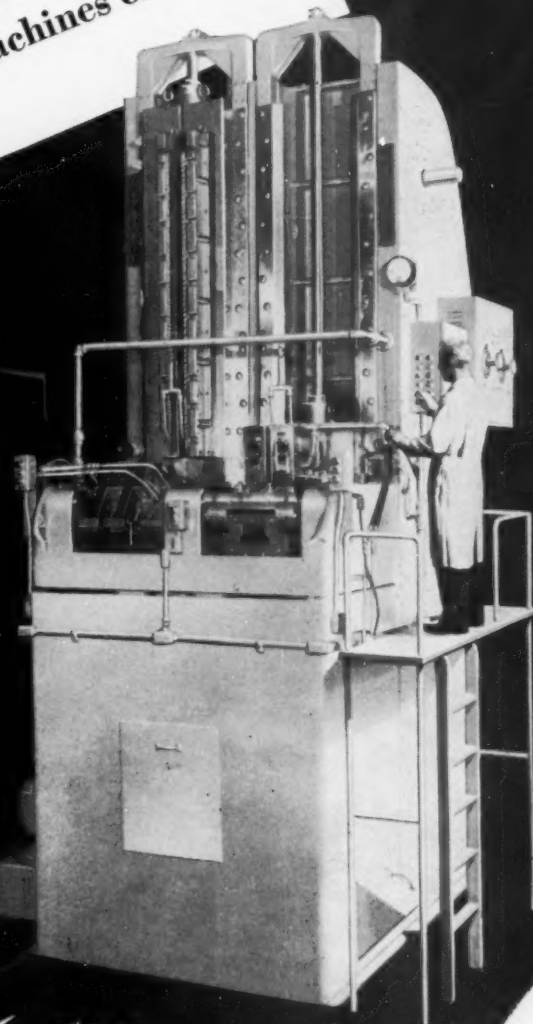
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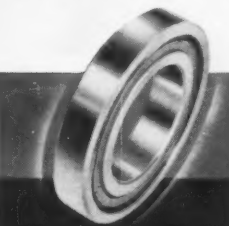
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July 12, 1956



### WHEN AUTOS CAME IN ONE COLOR

Hard to believe, isn't it, that the "last word" in the autos of our youth are now museum pieces. The automotive industry has drastically changed our mode of living and today is meeting the challenge of an apparently insatiable public demand for higher standards of design, power and comfort in personal transportation. Many of the advances in car design and performance have been made possible by improved steels. Working with automotive manufacturers to provide the *right* steels has been one of the important jobs at Inland for many years.

**INLAND STEEL COMPANY** 38 South Dearborn Street, Chicago 3, Illinois. Sales Offices: Chicago, Milwaukee, St. Paul, Davenport, St. Louis, Kansas City, Indianapolis, Detroit, New York. Steel products supplied to the automotive industry include hot and cold rolled sheets and strip, bars, plates, structurals, 4-Way safety plate. Other products: tin mill products, Ti-Co galvanized sheets, reinforcing bars, rails and track accessories, coal chemicals.



**INLAND**



## Heat Barrier Breakthrough?

It's not being broadcast, but industrial men with a close interest in aircraft developments are willing to bet that a new high-speed fighter plane is in the works, using ceramic-coated stainless steel as a covering capable of cracking the thermal barrier. It's reported 'somewhat past' research stages.

## More on Boron

Boron's been found to have a marked influence on the strength of 13 Cr, 15 Ni, 2 Mo, 0.6 Ti alloy at high temperatures. Air Force studies show that boron boosted creep rupture strength at 1200°F; that lesser amounts of boron were required with 0.6 pct titanium present. Other findings: that response to hot/cold work as determined by creep rupture strength at 1200°F was increased by boron additions, as were elongation, reduction of area.

## European Listening Post

A leading American research foundation fields a five-man engineering team this month. Their outpost, Europe, and their aim, to keep 18 sponsoring American firms informed of what's new in European technical developments. Operating from Hague headquarters, the observers will attend seminars, trade shows, conferences, technical meetings, etc.; will relay interesting items back to their non-competing sponsors.

## Railroads: Boxcar Quotas Possible

Railroads have a new worry—possible new federal legislation laying out just how many boxcars they must own. ICC would figure out how many units each road should maintain to assure ample number at harvest time. As a starter, Congress is being asked to pass a bill forcing user roads to return cars to owners quickly during car shortage periods. ICC would be allowed to up use charge from present rate.

## Aluminum Deburred Electrolytically

Electrolytic polishing has successfully deburred aluminum gears. Japanese researchers report the gears, produced from 99.6 pct alu-

minum plate, were deburred without difficulty, polished fine on their surfaces and rounded adequately on ridges when polishing was carried out in phosphoric acid solution of 1.4 specific gravity. The gear was hung in the cell as the anode with an aluminum plate as the cathode. Treatment was for 15-20 minutes with current density at 1.5-1.7 amp.

## Plant Dispersal: Still A Headache

Some congressmen fear that firms' reluctance to set up new plants in isolated areas is laying up big trouble for the future. Defense Dept. is split. It favors dispersal for security's sake, but realizes defense contractors will gravitate toward areas where labor, raw materials are handier. Some western senators argue enforced dispersal now will prevent greater industrial upheaval later.

## Seeds in Cleaning Mixture

Aluminum oxide mixed with either crushed peach or apricot seeds, in a 10-15, 85-90 pct ratio, is used by one major electrical manufacturer to clean rust and oxidized metal from steam turbine rotors, wheels and diaphragms returned for repairs. Aluminum oxide acts as the abrasive; crushed seeds keep dust down.

## Aluminum For Auto Coils

Aluminum strip conductor coils may take a larger chunk of the automotive electrical systems market if development work now underway by several large automakers pans out well. Several advantages are claimed for the sheet interleaved with anodic-coated insulated strip. Advantages include ease of winding, reduction of voids and in necessary thickness of insulation, better heat transfer characteristics, possibly halved conductor costs.

## Welding Sales Strong

Makers of resistance welding equipment are still going strong. Resistance Welder Manufacturers' Assoc. reports complete tabulations show January-through-May orders 103 pct above the corresponding 5-month period in '55.



# NOW!

## a new source for galvanized sheets



# J&L STEEL

Now sheet metal users can look to a new, dependable source of galvanized sheets. Jones & Laughlin Steel Corporation is putting more than 100 years of steel-making experience behind its new facilities for the production of high grade galvanized sheets.

New J&L galvanized sheets carry on the J&L reputation for quality steel. Produced with uniform ductility, flatness, and surface finish, they are typical of J&L ability to produce to exacting specifications accurately and faithfully.

Galvanized by the proven Sendzimir process, J&L Galvanized Sheets have a tight uniform coat-

ing that resists cracking and flaking, even during severe forming and drawing operations.

J&L Galvanized Sheets are produced with a high-lustre finish that creates eye appeal and customer acceptance for your finished products.

The next time you order, remember—J&L Galvanized Sheets are available in both coils and cut lengths to fit your continuous operations. They work up easily—can be formed, rolled, drawn and cut to your satisfaction.

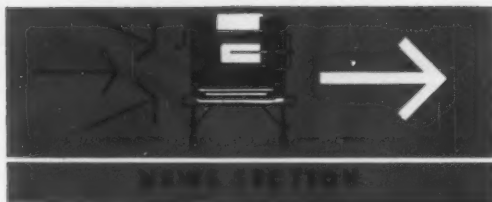
Available in a range of gages and widths to meet your requirements.

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## How Steel Strike Hit Metalworking

**Survey shows walkout will have almost immediate effect in some consuming industries . . . Freight car builders and construction in greatest danger . . . Pressure for settlement mounts behind the scenes.**

◆ **ONE MINUTE** after the steel strike began, metalworking was in trouble.

The degree of seriousness varied from company-to-company and industry-to-industry. Some firms claimed to be sitting on "comfortable" inventories that would carry them as long as 90 days. Others were approaching the critical point before the strike was a week old.

Even a short strike would leave some consumers in the lurch for months. All metalworking will feel the effects for balance of the year—either through shortage of critical shapes and sizes, or through a tougher scramble to keep production lines rolling.

Gray market operators went into action even before the strike was officially underway. Asking prices were stiff. Only other source open to desperate consumers was foreign steel. But in that direction, deliveries were uncertain, and most consumers were afraid of quality. At best, European mills can export only about 15 pct of output due to high home demand. And British steel itself was threatened with a strike.

An IRON AGE survey bore out pre-strike predictions on how various industries would be affected. Freight car builders were in the most immediate danger. The hand-to-mouth inventory position of the construction industry was aggravated. Big-time oil companies seemed to be in good shape on oil country goods and linepipe. But small, independent outfits were uneasy over the outlook.

As the strike began, finished

steel in inventory was estimated at 21.5 million tons, about three months' production. This included steel in metalworkers' plants up to the point of shipment.

But overall inventory figures are deceptive. Construction firms, heavy users of structurals and plate, were in sore straits. F. H. McGraw Co., for instance, planned to start laying off workers in two to three weeks. Pullman-Standard, builder of freight cars, operating at only 60 pct of capacity in mid-west prior to the walkout, announced a slowdown beginning in three weeks, and a complete shutdown in 60 days, barring a quick settlement. Main problem is structurals.

And steel production losses were enormous. With only a handful of mills still in operation (see page 130), raw steel production was off 300,000 tons per day, 2.1 million tons per week. Pre-strike slowdown alone cost approximately 250,000 tons of steel ingots. Post-strike buildup will cost even more.

### Quick Price Boost

A few days after the strike began, some consumers got hit with higher steel prices—an inkling of what will happen to all metalworking after the settlement. Producers who had agreed to make contract changes retroactive to July 1 boosted their prices \$8-\$9 per ton. (For details, see page 130.)

*Continued*

## Where They Were Before Steel Labor Walked Out

### Steel's Package

◆ **A four-year, four-month medium-cost package.** Cost would be about 65c an hour in wages and fringes over the contract period. First year cost, 17 2/3c an hour. Objective: A period of labor stability.

### Steel Labor's Rebuttal

◆ **In spite of one-year contract demand, steel workers would settle for a three-year agreement.** But they insist on telescoping companies' entire offer into that period. Also, they would like first-year benefits to approximate 21-22c an hour. No argument over once-controversial Supplementary Unemployment Benefits.



## SPECIAL REPORT

Issues in the strike were such that it could go on for weeks—or end overnight. But in either event a lot of compromising by both sides would be necessary.

Briefly, this is what the argument is all about:

The producers, anxious for a guarantee of labor stability and a damper on inflation, have offered a four-year, four-month, medium-cost contract. It would cost the mills roughly 65¢ an hour in wages and fringes over the contract period. First-year cost would be 17 2/3¢ an hour.

The United Steel Workers would settle for a three-year agreement, but would want to telescope the benefits offered by the steel companies into that period. Also, they want first-year benefits to approximate 21¢ or 22¢ an hour.

Government intervention apart from usual offers of mediation was not expected unless the strike lasted longer than 30 days. Observers figure six weeks as the absolute limit President Eisenhower would permit the strike to last. Behind the scenes pressure already is being felt by both sides.

Meanwhile, the Business and Defense Services Administration acted to protect defense production by earmarking critical alloys and shapes in warehouses for defense contractors.

### Defense Protected

The BDSA directive applied to aircraft quality steel in all forms and shapes; nickel-bearing stainless and alloy steel in all forms and shapes except ingots, blooms, billets, slabs, tube rounds, sheet bars and wire rods; carbon steel plate, including wrought iron, except floor plate, abrasion resistant plate, and plate less than 1/2-in. in thickness.

To protect small business and assure availability of steel for maintenance and repair purposes, the directive exempts orders of 500 lb or less for each form or shape of nickel-bearing stainless steel, and orders of 2000 lb or less

of carbon plate and alloy steel.

During first week of the strike, this is what IRON AGE editors found in a nation-wide survey of metalworking:

**Pittsburgh . . .** Pittsburgh metalworking plants are catching it from two directions. District fabricators are big users of plates and structurals, which have been scarce so long that no one has been able to build large inventories. And a sizeable portion of Pittsburgh metalworking centers around the steel mills. Makers of steel mill equipment will find finished stocks backing on them if the strike drags on.

### Koppers Hit

At the outset, most plants were operating close to normal. The labor contracts of fabricators organized by United Steelworkers have one or two months to run.

There was no general move to stage special vacation shutdowns.

Some companies were hit early. Koppers Co. cut 1500 men from the field force of its engineering and construction division. About half the division's work is in steel mills. Cutbacks were due to steel shortages or because men would not cross picket lines.

Spot shortages will begin pinching some plants if the strike lasts two weeks. Dravo Corp., builders of barges, will start hurting for steel in that period. Dravo has been short of steel right along, is particularly anxious about 1/4-in. plate.

A month-long strike would bring widespread cutbacks. United Engineering & Foundry figures its fabricating operations would be short of steel in this time although its foundries are stocked for two months.

## Steel Warehouse Picture

Based on a pre-strike sales rate, this is the picture as seen by American Steel Warehouse Assn., Inc.:

Product	Inventory
Structurals	Very short for past six months, virtually no inventory.
Plates	Equally short, with little or no inventory available.
Carbon Bars	About 5 to 6 months supply for normal consumption.
Sheets and Strip	They've been improving, now stand at 4 months supply based on June sales.
Galvanized	Good for 5 to 6 months.
Mechanical and Pressure Tubing	Ample for current needs and for immediate future, but with some spot shortages.
Alloys	OK for nearly six months at normal rate, except for nickel alloys.
Stainless	About 4 months for many products, but plenty of imbalance. No nickel bearing stock to speak of.
Tool Steel	Enough for 4 or 5 months.

## Foreign Steel

Koppers would close all 23 of its tar product plants after four weeks of strike. Same company's metal products division would be running out of steel in the same time. Gulf Oil Corp. estimates steel inventories at 30 to 60 days but has not been able to find the plate, structurals and tubular products for a balanced situation.

A two-month walkout would bring a general stoppage of industry in Pittsburgh. One manufacturer of automotive parts says he can operate for 60 days and after that there will be no one to ship to anyway. Some inventory estimates run as high as 90 days but with spot shortages, shutdowns in related companies and expiration of labor contracts, it's hard to see where there would be much doing after two months of steel strike.



**Chicago . . .** It will be three weeks before any general effect is noticeable and will then effect plate and shape users, though many of these say they can hold out for as long as six weeks. A few offers of premium price steel reported from the East.

Steel supplies range from three weeks to six months with extreme variations between companies. Important is the fact that a number of steel buyers, sometimes without a go-ahead from management, have been quietly laying in small amounts of stock even including structural and plate. These surplus tonnages plus the fact that some plants are counting on about two weeks of vacation shutdown will minimize early effects of the strike.

Most volume plate users feel they would have to suspend nearly all operations by the end of eight weeks and would be at half speed by the end of six weeks. Stampers are holding 30-60 days stock of sheet and are confident of warehouse help where average stocks seem to run about a 4-5 month inventory, which is good.

## Oil Country

Forgers are sitting tight with about four weeks operating inventory, which will stretch to six weeks as most have been on vacation since the strike began. Farm equipment can hold out 60 days, perhaps more if necessary.

Oil country is the big surprise. Big drillers have been cleaning out jobber stocks in anticipation of a strike, and casing and tube inventories will carry into early September. So a 4-6 week strike wouldn't hurt, they say. Main sufferers will be small independents who had planned to lean on jobber stocks of pipe and will find these exhausted early.

**Cleveland . . .** Fabrication plants

## Where the Pinch Begins To Hurt

### Typical Reactions

**East Coast Shipbuilding Co.**

"We're behind the eight-ball as of right now. We'll be out of production within two weeks."

**Locomotive Manufacturer**

"We'll begin to feel the pinch in a week or 10 days. We're particularly short of wide flange beams. We can't rely on foreign steel because customers object to basic bessemer."

**Bearings Manufacturer**

"We were surprised to hear the strike is expected to go more than two weeks. We can go eight weeks without being hurt, partly because we advanced plant vacations."

**Appliance Maker**

"Six weeks, but that's including two weeks shutdown in July for plant vacations."

**Materials Handling Equipment Maker**

"We can go three to four months, but plate is in very short supply."

## SPECIAL REPORT

and construction jobs are undoubtedly the worst hit with no more than about three weeks' work ahead and inventories practically zero in plate and structural.

Auto assembly plants and suppliers are in a little better shape with about 30-day inventories at the assembly plants and a relatively slow market. Auto suppliers also have good inventories and more available from warehouses.

### Ore Outlook

The great iron ore fleet would be slowed to a walk by July 15 when labor contracts for most seamen expire and ore movement would be down to a handful of vessels. Most ships run by shipping subsidiaries of steel producers were tying up early.

Recent offerings of foreign steel in Cleveland, which were originally turned down, are now getting a second look and undoubtedly will find a market shortly. Substantial tonnages of Belgian I-beams were offered a few weeks ago at 8.75¢ or about 2¢ per lb. above regular delivered mill price. Other domestic structurals in quantities to 2000 tons, including wide flange beams, have been offered by brokers at 12¢ per lb. or over double the normal price of about 5.80.

**Detroit . . .** All automotive consumers have enough steel on hand to finish out the 1956 model run. In one case they have enough to get a good start on the 1957 model. Actual working day supplies average between 35 to 45 days. American Motors Corp. says it has at least a 90-day supply and is not concerned about the length of the strike.

Generally, tool and die shops in the area have enough steel to finish their work on the 1957 car programs. These will end around the first of September. After that, nobody knows, but it is expected that tool and die work will fall off in the fall.

### Warehouse Picture

Warehouses in the area report

adequate supplies of flat-rolled and bar stock. They are extremely short of plate and structural but have been all along.

**Philadelphia . . .** In Philadelphia, the majority of steel consuming industries reported they would be able to hold normal production schedules for four to eight weeks. Two large industries—a locomotive manufacturer and a shipbuilding firm—said they would start hurting by the end of this week if steel plate, wide-flange beams and structurals do not reach their yards.

Appliance makers appeared in fairly good shape. RCA at Camden, N. J., and Philco Corp. are in this category. Philco has enough inventory to carry through for six to eight weeks. Both are relying on a two-week vacation shutdown for some respite. A third electrical firm, ITE Circuit Breaker Co., would be able to maintain its production rate for about six weeks before running low on alloy bars and sheets.

**New York . . .** Eastern metalworkers are running scared, but most think they can keep running for a while. A really long steel strike would cause almost universal layoffs and shutdowns, but most plants queried feel they could keep going for about 45 days.

In an area like the East, where industry is so highly diversified, the steel situation follows suit. But many firms saw the strike coming, boosted already strong efforts to get steel stocks. To some degree they succeeded. But even good inventories are short in some items. Plates and structurals are the most wanted products, followed by hot-rolled bars and pig iron for foundry operations. New worry is nickel-bearing alloy grades. Most consumers had been living hand-to-mouth on these before the strike, now fear the effects of government controls.

### Appliances Worried

Construction is the exception to any optimism. F. H. McGraw would start laying off ironworkers in 2-3 weeks, with other trades following. A leading chemical company, in the midst of an urgent

expansion program, sees "almost immediate" halts on its projects. This company traditionally carries only maintenance stocks of steel, farms out its construction work.

**Foreign Steel . . .** Foreign steel is in the picture, but only in the background. Many firms shy away from it for quality reasons under any circumstances except sometimes for repairs. But the past tight steel market has forced some American buyers to sign up for it. At best there won't be too much available, since European mills can export only about 15 pct of output due to high demand. And those mills are booked solid through fourth quarter. Some strip and light structural should reach this country in September or October. Anything else that gets here is already spoken for.

Price of imported steel is another deterrent. At best it is more costly than the domestic product, often goes through several hands before reaching the ultimate consumer. In time of great shortage, the opportunities for "daisy chain" price boosting become formidable.

**Birmingham . . .** Situation in this area has been bad for several months because of the railroad workers' shutdown of the plants of U. S. Steel's Coal & Iron Div. The general steel strike has made matters worse.

TCI supplied more than 75 pct of the steel consumed in the district. Many fabricators depended entirely on this steel, while others have been getting small amounts from other mills.

Not one of more than a dozen fabricators contacted said they are still operating fully and all say they have been forced to lay off workers. All say it is only a matter of a couple of weeks or so before there will be no steel left.

**Buffalo . . .** Most Buffalo area steel consuming plants indicate they have pretty good inventories and can hold out as long as three months.

Plates and structural steel are critically low. Warehouses have about 60-day supplies with the exception of structural steel and plates.



## ANTITRUST: GM Has a Fight on Its Hands

**Justice Dept. doesn't appear to be fooling . . . Complaint that GM monopolizes bus sales is strong case . . . GM denies wrongdoing, says its leadership due to product . . . Cleared with Ike—By T. L. Carry.**

◆ NOW that the battle lines have been drawn between General Motors Corp. and the Justice Dept.'s antitrust division, it will probably take years before an actual decision is handed down in the case.

Specifically, the government charges GM with monopolizing the manufacture and sale of buses and with conspiring with four bus operating companies to maintain the monopoly.

Alleged co-conspirators in the case are Hertz Corp., Greyhound Corp., National City Lines, Inc. and Public Service Coordinated Transport Co.

The complaint charges that GM made at least 65 pct of all buses sold in the U. S. from 1952 to 1955. Last year, it is charged, the corporation accounted for about 85 pct of all buses sold and sales amounted to approximately \$55 million.

### Favored Customers

Among other things, the suit charges that GM obtained its alleged monopoly by having Charles F. Kettering, a director of GM, serve as chairman of the board and major stockholder of a principal bus-making competitor, the Flexible Co.

It is also charged that GM refuses to sell buses to competitors of favored customers and uses its financing subsidiary, Yellow Manufacturing Acceptance Corp., to extend preferential financing terms which competitors cannot meet.

In addition, the suit charges that GM refuses to sell various bus parts, including diesel engines and automatic transmissions, to competitors and that the corporation has exclusive rights to many improvements.

The complaint asks that GM be prohibited from selling more than 50 pct of the annual bus requirements of the co-conspirators.

In addition, the complaint asks specific relief to the patent rights allegedly abused and asks that GM be required to extend to other manufacturers the financing facilities of Yellow Manufacturing Acceptance Corp.

### GM's Side

In a statement issued almost simultaneously with the filing of the government's case, Harlow H. Curtice, president of General Motors, says that GM has no financial interest in any manufacturer or operator of buses.

Mr. Curtice denies that GM discriminates regarding prices, terms and conditions in selling its buses. It is his contention that GM has a dominant place in the bus industry because of the quality of its products.

The government's action, according to Mr. Curtice, in effect

tells the customer that he is not free to buy the product where he can get it to his best advantage.

### Good Record

Since the Eisenhower Administration took office in January, 1953, the Justice Dept. has filed a total of 145 antitrust cases and has won 145. Not all the victories were cases initiated by the present administration but the box-score reflects a consistent accuracy.

The suit reportedly has been cleared by the White House and the President's political advisors, and there are charges in some circles that election-year politics entered into the decision to file the suit.

There is little doubt that the Republican administration's moving against the firm from which it recruited the present Secretary of Defense Charles Wilson will help GOP political candidates and remove some of the "big business" charges.

## History of GMC Truck and Coach Division

■ GM entered the bus field in 1925 by acquiring a stock interest in the Yellow Truck and Coach Manufacturing Co. in Pontiac, Mich. It obtained all of Yellow Truck's assets in September, 1943, when it held 50.5 pct of Yellow Truck's voting shares. This was done by issuing minority shareholders \$28 million in GM stock.

Yellow Truck Div. later became the GMC Truck and Coach Div.

Early this year a Senate subcommittee looking into anti-trust laws estimated that GMC produced 80 pct of all buses manufactured in the U. S.

Sources estimate that of the 4023 commercial buses produced in 1955, the GM division manufactured more than 3500.

## ADHESIVES: Moving Into the Big Time

**Metal bonding with adhesives gaining popularity . . . Biggest gains made in joining dissimilar metals . . . Flexibility in form and physical characteristics key to growth—By F. J. Starin.**

♦ BONDING of metal with adhesives is taking its place along side welding, riveting and fasteners in the field of metal joining.

Major advance of adhesives in metalworking occurs where dissimilar metals with little or no affinity for one another must be joined. In the growing field of joining metals to non-metals; ceramics, glass, plastics, wood, etc., adhesives have things pretty much their own way.

Advantages claimed for adhesives include generally lower initial cost, lighter weight, less finishing required. But most important of all is flexibility.

Adhesives are currently available as paste, powder, or liquid; for application by brush, spatula, dip, roller or extrusion. Use of heat (thermosetting) will govern length of curing, or drying time, from days to a matter of minutes.

For metalworking purposes, there

are three basic classifications. Within each classification are hundreds differing in chemical formula and applicative form. The three groups are (1) epoxy—strongest but highest in price, (2) phenolic—more flexible with less strength and lower price, (3) rubber and solvent combinations—where positioning rather than strength is important.

Adhesives are available in an entire range of tensile strengths, up to 5000 psi, with equivalent in shear, peel, impact, vibration or bend strength. Some adhesives feature special qualities such as resistance to sunlight, abrasion, water or solvents.

### Case Histories

In their specialty field of joining metals of dissimilar nature, there are any number of outstanding examples:

Carbide tool manufacturers at-

tach carbide tips and wear points to steel bases with an adhesive. One company uses an adhesive to bond tungsten carbide bushings, used as guide rings, in countersunk holes in a steel disc.

### Non-metal

Another manufacturer uses an adhesive to join a stainless steel pipe to an aluminum box housing where an absolute vacuum seal is necessary. Units operate at 200°C for several hours per day. Joining was accomplished in a single operation with a Rubber & Asbestos Corp. adhesive. Helium mass spectrometer tests revealed no leakage, and strength test to destruction resulted in aluminum shearing while the bond held.

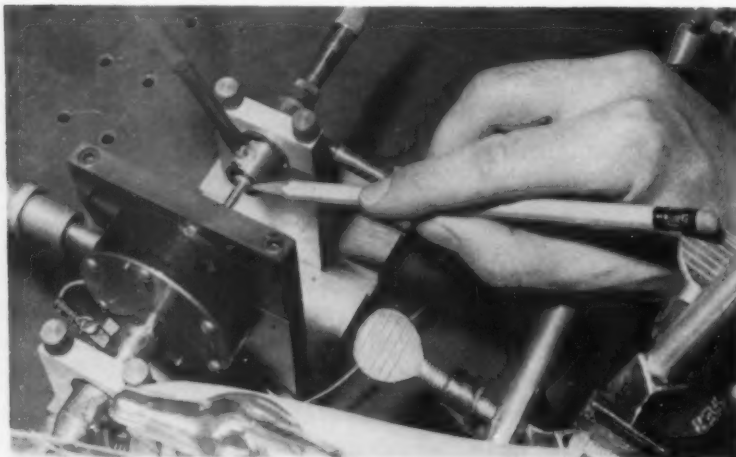
In the field of joining non-metals to metals, probably the biggest single application in this market is in the fabrication of metal curtain wall panels. Non-metallic core insulation, such as impregnated paper honeycomb, plastic laminates, foamed material, is bonded to a reinforcing subskin of plywood or asbestos-cement board which in turn is bonded to the ornamental exterior metal skin, all with adhesives.

Another major market is bonding copper sheets to insulation base for production of printed circuits.

### Disadvantages

Despite the technological progress, which is greatly responsible for the current sales spurt, adhesives are not out of the woods in solving many disadvantages for production joining.

Although there are products on the market which are premixed with a shelf life up to six months, most adhesives have such a short pot life, short as a half-hour, that



STEEL to brass to glass, metal bonding adhesives' two big markets in a single application. Pencil indicates steel to brass joint (dissimilar metals); glass tube adheres to top of brass cylinder (metal to non-metal). Device is a vacuum station used at Polytechnic Institute of Brooklyn.

resin and hardener must be mixed in small batches as required. This is a major process since exact blending is a must.

Other major problem is fact that most adhesives lose surface tension during curing, and flow onto surfaces that are not to be bonded. Problem is compounded by the fact that in most cases solvents have little or no effect after adhesive has dried. Again, there are adhesives on the market which are thixotropic—do not flow even when thermoset. But most common solution is chemical treating of surfaces to prevent adherence.

### Not By Catalog Alone

... can an adhesive be selected, says Jerome L. Been, vice president, Rubber & Asbestos Corp., Bloomfield, N. J. Each R&A customer gets an analysis form on which he indicates preference in:

form	resistance to:	temperature
method of application		solvents
viscosity		chemicals
drying time		sunlight
curing temperature		abrasion
pressure available		water
required pot life	toxicity	
bond strength	stability	
flexibility	aging	
color	odor	
storage conditions	materials affinity	

Pricewise, adhesives are in a good competitive position. Average price of a strong epoxy adhesive runs from \$1.81 to about \$3.05 per gallon.

### Big Customers

Currently big industrial customers for adhesives are automotive and aircraft companies. Aircraft industry was pioneer in use of adhesives for joining dissimilar metals, while auto was first for metal to non-metal. List is growing rapidly. But rate of market expansion is not considered a true indication of the outlook. Because of the hundreds of adhesives available, as many as 30 from a single company, and because for many customers use of adhesives is a radical innovation, company and adhesive engineers often work for a year on selecting proper adhesive and proper technique before a representative order is placed.

## MAINTENANCE

# LABOR: Control The Variable

**Many firms are missing the boat by not applying cost control systems to maintenance operations ... A plan for keeping tabs on the biggest variable can pay off.**

♦ **SUBSTANTIAL** savings in maintenance costs are possible for companies willing to adopt a simple plan for controlling the big variable in maintenance costs—labor.

The plan, as outlined by George E. Meyers, a Waban, Mass., management consultant, is not too different from other plans used successfully for controlling costs in production areas.

First, management must be sold on the fact that an adequate staff, comprising roughly one individual for every 75 maintenance employees, is necessary for handling the cost control job.

Second, establish procedures which will determine the costs.

Third, set up a timekeeping system.

### Timekeeping Important

In establishing the cost determining procedures, routine order numbers should be assigned to every maintenance job individually and by craft, so that workers may charge the job with hours spent on it. The order numbers should be in sequence, should contain a good description of the work required and provide space for charge account numbers for proper accounting and distribution of costs.

In setting up timekeeping procedures, there are three principal systems from which to choose: (1) A central system whereby the workers report to a control desk the order number and the starting and stopping time for each job; (2) The worker can carry his own daily card and enter the pertinent information himself; (3) The foreman prepares the daily card for the worker.

Whatever system used, an audit

would have to be made to insure that the time shown on the workers' daily job card agrees in total with the overall time card by which the worker is paid, as a check to insure accuracy.

Then, all order numbers should be tabulated so that costs may be attributed to the individual jobs. A base period of 6 months is regarded as adequate for establishment of cost standards, except where jobs have a total cost of \$2000 or more.

### Benefits Are Many

Climaxing the program, a cost control report should be prepared for each pay period. The report should reflect, by craft: (1) The trend in future costs of maintenance work as compared to base period costs; (2) The future effectiveness of maintenance personnel as compared to the base period, and (3) The volume of maintenance work completed each pay period expressed in man hours.

If handled correctly, a maintenance cost control system has many benefits. It offers an improved organization structure, both as to personnel and allocation of duties; it provides management with a planned preventive maintenance program; shows the way to effective planning and scheduling of maintenance work; establishes minimum costs for maintenance consistent with maximum operating time of production facilities and, most important, reduces maintenance costs substantially.

Great strides have been made in budgeting, cost control and planning schedules in production areas, it is only logical that cost-conscious managers follow through in the long-overlooked field of maintenance.

## FORGERS: Why the Cheerful Outlook?

**Despite sagging sales to automotive and farm implement companies, forgers are having one of their best years . . . Business comes from unexpected sources . . . Strike will hurt, but will leave backlogs—By K. W. Bennett.**

♦ WITH THE FORGING industry left holding the bag by the steel strike, there's growing concern among forgers that they won't be able to handle customer demand after mid-August.

For an industry that reportedly took a beating saleswise when automotive and farm equipment business began sliding off at the end of first quarter, the unusual amount of concern suggests business can't be quite so bad as pessimists have indicated.

A steel buyer for a midwest forging concern was typical in his comments. "We've heard about business slowdowns, but we're operating at about as close to capacity as we can get right now. We've

a four week supply of steel on hand. We're getting into our plant vacation shutdown. That's two weeks. So we can eke our steel out to six weeks at present operations. After that, we're in trouble, and I mean it."

### Good Start

The statistics through April show the forgings industry this year was shipping about 105 pct of the tonnage shipped in the same period 1955. The difference was that in 1955 the monthly tonnage figure continued to move up through much of the year from a low January total. In 1956, January has been the highest shipping month thus far, and April

has fallen below March. Statistics don't tell the entire story, however. In March of last year there was similar peak, and it was beneath the March peak of 1956.

In April, forging business fell off last year just as it did this. In May forgings business fell again, just as it probably has this year.

When the bottom dropped out of automotive and farm equipment purchases of forged components in second quarter 1956, there was considerable speculation that this was the beginning of the end. Not so. At least one major concern indicated that June was better than May this year, as last year, and that total business is better than 20 pct ahead of the year ago figure thus far in 1956.

Another, sensing a windfall of defense business, particularly aircraft, is coming with the first winds of autumn, has a sales chief who bet his billings will double next year over this, beginning in late second half 1956. It could mean a rise from over \$1,000,000 per month this year to double the figure in 1957. Another reports May one of its highest months this year.

### Surprise Business

With the traditionally heavy automotive and farm equipment markets dead or still dying, where do the forgings go? One small forge shop reports they are keenly fearful of a shortage of forging billets. The reason: a windfall of new accounts in power lawnmowers and gardening equipment, as well as air conditioners, has them hammering out steel at capacity at the moment. They're shut down for an early July vacation, but will be back in August at a capac-

## Forgings: Down But Not Out

Monthly Production  
Thousands of Net Tons





ity operation. August, last year, was the lowest non-vacation month on the calendar as far as output goes.

Another source reports that flat die work stemming from the ship-building program has been moving up all year, despite the steel plate shortages, and seems to be going ahead under full steam right into the normal summer slump period. A small shop which has taken on a considerable number of accounts which call their product in the Christmas and "cold weather" period reports that orders are coming in, just on schedule, and though volume is a little lower than was the case last year, the shop should run at April and May levels from September well into the remainder of second half.

#### **It's Only Seasonal**

Any shop with accounts buying forged components going into construction equipment, material handling equipment, and heavy automotive hauling equipment, reports these accounts booming.

There has been a decline in forgings activity from the March peak. No doubt about it. But it's no more than would be expected of a seasonal pattern, and doubly amazing because it's been done with little aid from automotive and farm equipment buying. Forge shops suffering most acutely have been chiefly those with the majority of their customers concentrated in those two lines. The industry, as a whole, is doing fine, and in some cases is enjoying the best year in industry history.

#### **New Soaking Pits**

Eight modern reheating furnaces will be added to the 45 in universal slab mill at the Homestead District Works, U. S. Steel Corp.

Construction of the top-fired, recuperative soaking pits is scheduled to begin almost immediately.

To house the new facilities present reheating building will be extended 188 ft.

Furnaces will be fired with mixture of natural and coke oven gas.

An additional pit crane will also be installed.

## **Aluminum:**

### **Harvey, Alcoa, Bohn plan major expansion**

Expansion continues to be the big item in the aluminum industry. Harvey Machine Co., Calif., has arranged to borrow \$44 million from three banks to help finance construction of a \$65 million, 54,000 tons per year primary aluminum plant at The Dalles, Ore.

Actual construction is expected to begin in the immediate future.

According to Harvey, the General Services Administration has first call on production. Harvey has promised to produce 270,000 tons by June 1963. What GSA doesn't need non-integrated users will get. Power will be supplied by Bonnaville Power Administration.

#### **Fabricators Too**

Aluminum Co. of America will add two new potlines to its Massena, N. Y. works, with construction scheduled to begin shortly.

## **EXPANSION**

New lines will replace older facilities which will become inoperable when the Alcoa power subsidiary shuts down in favor of power from New York State Power Authority.

New supporting facilities will include rectifier station, structure for additional carbon electrode manufacture, metal casting, and maintenance equipment.

And on the fabrication side of the fence, Bohn Aluminum & Brass Corp., Detroit, has purchased 30 acres near Butler, Ind., to be used as site for a plant to produce aluminum rolled rod.

#### **Bigger Delta**

Delta Power Tool Div., Rockwell Manufacturing Co., Pittsburgh, has launched an expansion program aimed at increasing its total manufacturing facilities by 70 pct in 1957.

New additions will be made at plants in Tupelo, Miss., and Bellefontaine, O., totaling 211,000 sq ft of additional floor space.

## **Expansion Briefs**

**Formsprag Co.**, Van Dyke, Mich.; clutch manufacturer; new addition to plant, will double plant capacity.

**Reo Motors, Inc.**, Lansing, Mich.; expanded line of heavy duty vehicles by 30 basic models, with axle and transmission options, it means 100 different vehicles.

**Rohr Aircraft Corp.**, San Diego, Calif.; will build half-million dollar aircraft subassembly plant, Auburn, Wash.

**Textron, Inc.**, Providence, R. I.; purchased two Los Angeles, Calif., plants; Hall-Mack Co., manufacturers of bathroom accessories; Peat Manufacturing Co., diecasting and plastic parts maker.

**Diamond Steel Corp.**, Chicago; awarded contract to Northern Builders Inc., Chicago, for addition to Natoma Ave. warehouse; cost about \$150,000.

**Elastic Stop Nut Corp.**, Union, N. J.; new 10,000 sq ft addition, providing more warehouse and shipping facilities.

**National Lock Co.**, Rockford, Ill.; new plant to be devoted entirely to manufacture of screw and bolt products.

**Ulbrich Stainless Steels**, Wallingford, Conn.; new plant wing adds 15,000 sq ft.

**Valenite Metals Corp.**, Madison Heights, Mich.; to expand plant facilities to triple present size; expect completion by fall.

## CANADA: Mills Expand To Meet Demand

**Rising demand leads to enlarging of production facilities, use of new techniques and development of ore deposits . . . Railroads, uranium mines and Seaway Project are among the potential consumers.**

♦ "THE STEEL BUSINESS is going to be so good in 1956 that we'll have to put all our customers on a quota," states the chairman of the board of one of Canada's major steel ingot fabricators.

With this paradoxical situation where steel demand is so high and customers are lining up waiting for orders to be filled, the Canadian steel industry safely sees itself hitting the 5,000,000 ton mark by the end of 1956.

If present orders for structural steel and plate in Northern Ontario's new uranium mines and Western Canada's new oil wells should fall through, the railway freight car program and industrial building contracts in Canada could still send the steel tonnage up to the five million mark by themselves.

Canadian steel mills—there are

about 10 major ones—had manufactured 4,400,000 ingot tons of steel and about 2,500,000 tons of pig iron by Dec. 31, 1955. About 1,200,000 more ingot tons of steel were turned out in 1955 than in 1954. To meet long term, future business these Canadian steel mills are well into the construction stages—and in some cases production stages—of new equipment. Here's what they're doing.

The Steel Co. of Canada, which makes 45% of all Canadian steel ingot, has announced a \$100,000,000 expansion program. A new slabbing mill, and a second electrolytic tinning line will be built. Since 1950, Stelco has spent \$105,000,000 improving and enlarging steel making facilities in all its plants. Both Stelco and its neighbor in Hamilton, Ontario—Dominion Foundries & Steel Co.—have

been using the 900-ft galvanized steel line since the late summer. Dofasco has also built Hamilton's sixth blast furnace and is beginning work on a hot roughing mill.

### The New Look

New techniques to speed up steel manufacture are reported from other Canadian mills.

In the Maritime, Dominion Steel & Coal Corp., which employs one sixth of the working force of Nova Scotia, is working on a new style coal furnace. Though this seems retrogressive, Dosco officials must bear in mind that coal mining is still a major industry in the Maritimes despite oil and diesel fuel inroads in transportation.

From the other coast of Canada came the announcement last April that Western Canada Steel Ltd. put into commercial operation the world's first completely electric semi-integrated steel plant. This involves the use of the world's largest electric induction-heating equipment and marks the first time steel ingots have been heated this way.

### Search for Ore

But technical developments are only part of the story. Equally vital is the search for new iron ore deposits in Canada. During 1955, both Algoma Steel Corp. and Stelco established multi-million dollar new iron ore finds. Algoma opened a 100 million ton potential ore deposit at a value of \$5 per ton. These ore beds are near Otawa.

In Alberta, already lush from oil and uranium finds, the chances of establishing new steel mills close to recently-found iron ore yields is a definite possibility.

## Slabbing:

### Inland Steel orders new slabbing mill

Inland Steel Co., Chicago, has placed an order with United Engineering and Foundry Co., Pittsburgh, for a new universal slabbing mill, to be installed at Indiana Harbor works, East Chicago, Ind.

Mill will handle 1.8 million tons of steel per year initially, later increase in capacity expected.

Decision to include a slabbing mill in Inland's \$260 million expansion program was deferred until now to permit investigation into continuous casting of steel.

Hjalmar W. Johnson, vice president in charge of steel manufac-

turing said that tests were encouraging but there was not enough time to master all problems and perfect a unit which could be incorporated into existing facilities by the time the rest of the program was completed.

Commenting on the continuous casting tests, Mr. Johnson reports that a great deal of technical knowledge was accumulated which, when properly assembled, would be made available to the industry in technical journals.

Through the cooperation of Atlas Steels Ltd., Welland, Ont.; Allegheny-Ludlum Steel Corp.; Continuous Metalcast Co.; and Koppers Co., a series of rimmed, semi-killed carbon steels were processed, cast and shipped to customers.

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## GILSONITE: A New Source for Fuel

**Mineral from Utah mines can be profitably converted to gasoline, fuel oil and coke . . . Refinery now under construction will be in production next spring . . . Aluminum industry a likely user—By G. G. Carr.**

♦ **GASOLINE** and other petroleum products from a source other than crude oil are in process of becoming a commercial reality.

American Gilsonite Co., Salt Lake City, is building a \$16 million project in the Far West to convert the mineral Gilsonite into high-octane gasoline, fuel oil, and high purity electrolytic coke for the aluminum industry.

The project includes installation of modern wet mining equipment at the company's mines in Bonanza, Utah, construction of 71 miles of 6-in. pipeline to carry the mined Gilsonite in water slurry form to the refinery, and a processing plant near Grand Junction, Colo. Startup of the plant is slated for spring, 1957.

### Pilot Plant Tryout

Initial plans for the project were announced last year after several years of research and pilot plant work by American Gilsonite Co. and California Research Corp., subsidiary of Standard Oil Co. of California.

American Gilsonite Co. is a joint affiliate of Barber Oil Corp. and Standard of Calif.

Pilot plant experiments have proved that Gilsonite can be commercially converted into very high purity electrode coke and high-octane gasoline, according to Ernest F. Goodner, president of American Gilsonite. He expects the coke to find a ready market for electrodes for aluminum refining and similar uses. The gasoline will be sold in western Colorado at prices competitive with current gas station prices.

### Mined Wet

The refinery plant will convert Gilsonite into 50 pct green coke, 35 pct gasoline and 15 pct 1400-BTU gas which will be used as plant fuel. Initial coke output will be 250 tons daily. Plant is designed to permit an increased charging capacity to boost coke output to 500 tons per day. With coke output at 250 tons, daily production of gasoline will be 1300 bbl and fuel, 300 bbl. To support this rate, the pipeline must deliver the equivalent in slurry of 630 tons of Gilsonite.

In actual operation, the Gilsonite will be mined wet and the resulting slurry will be pumped from

the mine through a \$2 million pipeline to the Colorado refinery 70 miles away. It will be operated from a pipeline pump station at Bonanza, with no intermediate pumping stations. Discharge rate of the pipeline will be from 200-500 gal per min.

### Extra Hydrogen Needed

At the refinery, the slurry will be dewatered and the dried ore melted to provide a continuous liquid charge. Preheated to 450 F, the liquid coke will be charged to a delayed coker. Overhead from the coker will be fractionated and the gasoline fraction processed in a 2-stage catalytic reformer. Heat from the bottoms of the fractionator will be used to melt the incoming Gilsonite ore before it is sent to the coker.

The catalytic reformer will be unusual because it will not produce enough hydrogen to fill its own needs. Extra hydrogen will be produced from the process gas.

After reforming, the gasoline will be finished and blended for marketing in western Colorado, now served from distant refineries. The coke will be calcined and shipped in covered hopper cars to markets primarily in the northwestern United States. Company spokesmen say that it is unlikely that steel mills will pay the comparatively high price for the coke against byproduct oven coke to use as a blast furnace charge. However, the very low ash and sulphur of Gilsonite coke might bring it some use as a sweetener for coke made from off-grade western coal. But steel mills are expected to use the coke for electrodes and for carburizing.

Pipeline water will be clarified and used for process cooling.

## And Just What Is Gilsonite?

■ **Gilsonite** is a black, solid hydrocarbon with a high resin content. Technically an asphaltite, but different from asphalt, it is believed to have been formed from petroleum or crude oil many millions of years ago.

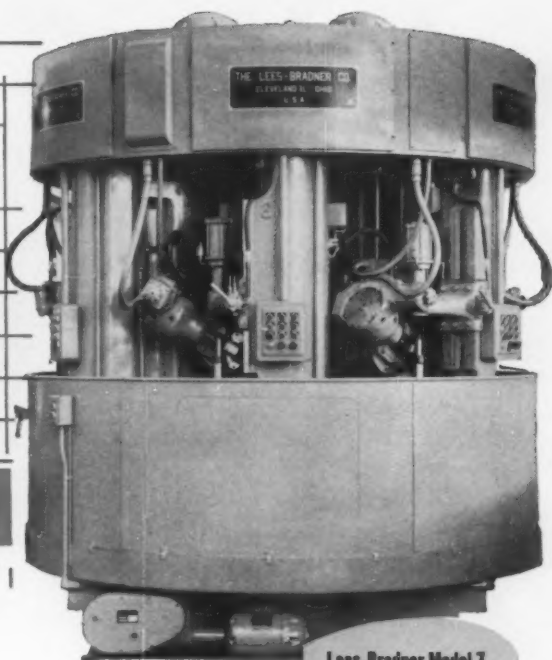
It has been used largely in making asphalt tile for floors, storage battery boxes, inks, paints, varnishes and as insulation for hot underground pipes.

The name "Gilsonite" is patented by American Gilsonite Co., a joint affiliate of Barber Oil Corp. and Standard Oil Co. of California.

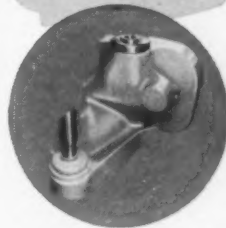


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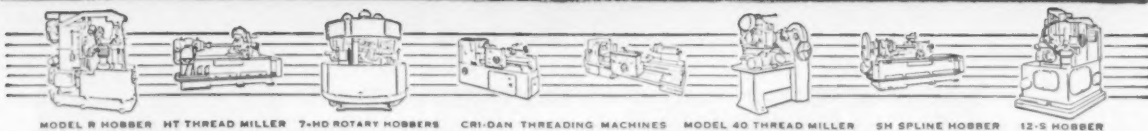
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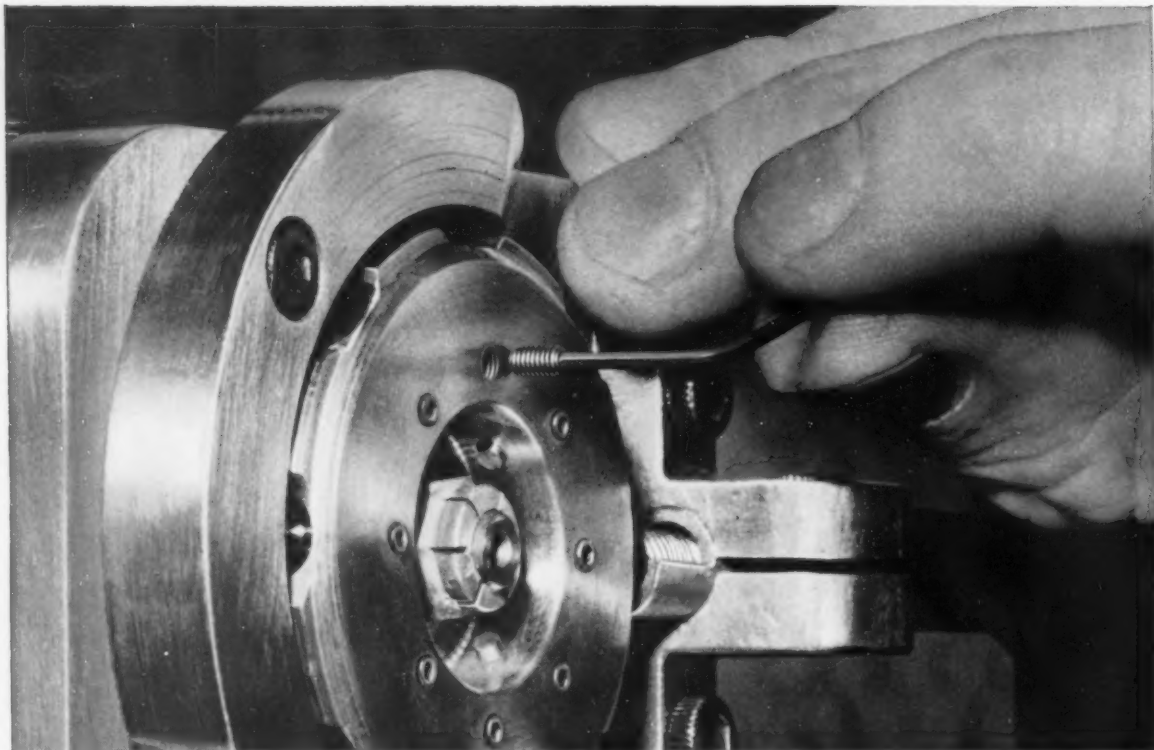
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# 0	D .060	80	1/16	..	.5	.01
	F .028	80	3/32	..	.5	.01
	..	80	1/8	..	.5	.01
	..	80	3/16	..	.5	.01
	..	80	1/4	..	.5	.01
# 1	D .073	72	1/16	..	1.5	.02
	F .035	72	3/32	..	1.5	.02
	..	72	1/8	..	1.5	.02
	..	72	3/16	..	1.5	.02
	..	72	1/4	..	1.5	.02
# 2	D .086	56	1/16	1.5	..	.03
	F .035	56	3/32	1.5	..	.03
	..	56	1/8	1.5	..	.03
	..	56	3/16	1.5	..	.03
	..	56	1/4	1.5	..	.03
# 3	D .099	43	3/32	5.0	..	.04
	F .050	48	1/8	5.0	..	.04
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	..	48	1/4	5.0	..	.04
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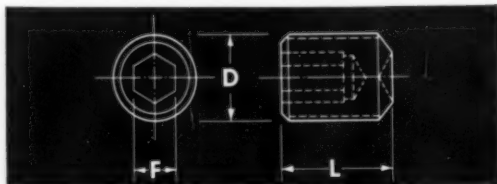
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## REPORT TO MANAGEMENT

**What Follows the Steel Strike?**

Effects of the steel strike on the U. S. economy depend, of course, on its duration. Steel consuming industries are quick to feel the impact, but others soon share the brunt. (See Special Report, p. 31.)

Strikes of any length in major industries are usually followed by periods of brisk economic activity. This has been particularly true in the postwar period when cutting off production of most products has had the effect of creating pent-up demand.

But a different pattern may materialize in the current steel strike. This is because of the product situation among steel consumers.

Makers of consumers' goods, even durables, appear to be fairly well situated in steel. There is no immediate prospect of shutdowns in the auto or appliance industries, both with heavy inventories of cold-finished sheets and most of the necessary products.

To be hurt almost immediately are the makers of heavy industrial equipment and capital goods, where the shortage of plates and structurals is most acute.

**It Could Be Serious**

It's been well established that capital goods expenditures for new plants and equipment have been the big factor in keeping the 1956 economic rate at its high level despite the number of soft spots.

In addition to the danger of taking so many consumers out of the market through loss of paychecks, there is the possibility of serious curtailment in capital goods outlays.

**Big Plans in the Works**

Surveys by the Dept. of Commerce show that business expected to increase plant and equipment expenditures through the third quarter.

**Reports indicated business**

planned to spend at the seasonally adjusted rate of \$36.7 billion in the July-August-September quarter. This compares with a planned \$34.8 billion rate in second quarter.

**But actual spending in the**

first and second quarters was less than had been planned. And stepped-up plans for the second half of the year are interpreted as a rescheduling of capital expenditures because of first-half delays in construction and equipment deliveries.

**With these plans already delayed**

by shortage of steel and manufactured equipment, even a short steel strike will compound these delays. Obvious conclusion is that capital spending would be drastically curtailed, with possible serious effects on the economy.

**Where the Money Is Going**

The durable goods industries will spend \$2.127 billion in the third quarter, compared with \$1.426 billion in the first quarter. These figures were compiled before the steel strike began.

**One important point in expansion**

plans is that the auto industry is maintaining its \$1 billion increase over 1955 despite discouraging sales. Planned investment in durable goods will constitute almost 23.5 pct of all plant and equipment outlays.

**What About Inventory Buildup?**

While a lengthy steel strike could make talk of manufacturers' inventories academic, they have frequently been pointed to as danger points.

**But second guessing now**

shows that inventories have not grown out of pace with expanded business activity and unfilled orders, although there are exceptions, particularly in unsold automobiles.

## INDUSTRIAL BRIEFS

**Clamp, Clamped, Klimp . . .** A new clamp has been invented by North American Aviation packaging engineers to replace nails in fastening together cleated panel boxes. It may result in savings of millions of dollars a year in shipping costs to industry and the U. S. Air Force. Named the "Klimp," the device is an L-shaped clamp for spring steel that can be used over and over again.

**Producing Progress . . .** Carbonyl Dept. of General Electric Co., Detroit, will be known as the Metallurgical Products Dept. to reflect the company's greater emphasis on specialty metals development and manufacture.

**Southwest Conference . . .** Alco Products, Inc., and the Power Machinery Co. of Tulsa and Kansas City jointly announced appointment of Power Machinery as exclusive manufacturer's agent in Oklahoma and Texas for ALCO oil field equipment.

**It Adds Up . . .** Shareholders of ElectroData Corp. have voted in favor of consolidation with the Burroughs Corp. of Detroit on the basis of a stock exchange plan by which they receive one Burroughs share for every two held in ElectroData.

**Manless Chopper . . .** The Navy Dept. has awarded a contract to Piasecki Aircraft Corp., Philadelphia, to build an experimental vertical lift aeronautical development, nick-named the "Sea Bat," which will be unmanned and completely automatic in flight, controlled electronically from shipboard or land bases. Its compactness permits operation from restricted areas aboard small warships and it can be stowed aboard submarines.

**Another Stripe . . .** Mesta Machine Co., Pittsburgh, Pa., was honored with the presentation of a Certificate of Appreciation from the United States Second Army in recognition of its policy which permits employees to fulfill their military training obligations without loss of earnings or vacation time.

**Fire One . . .** Loftus Engineering Corp., Pittsburgh, has been awarded a new furnace contract by Rem-Cru Titanium, Inc. This furnace is natural gas-fired and is a continuous double row, walking beam type. It will be installed at Crucible Steel Co.'s Park Works, Pittsburgh.

**Favorite Son . . .** William F. Ryan, vice president, director and senior consulting engineer of Stone & Webster Engineering Corp., Boston, has been nominated to serve as the 1956-57 president of The American Society of Mechanical Engineers.

**Silver and Gold . . .** Winners of the Lyrand Award Gold and Silver medals have been announced by the National Assn. of Cost Accountants. Eugene R. Donat, of Collins Radio Co., Cedar Rapids, Ia., received the first place Gold Medal for his paper entitled "A Progress Report of Our Computer Installation." Second place Silver Medal was awarded to Leland G. Spencer, General Electric Co., Pittsfield, Mass., for his paper entitled "Considering Length of Run in Product Costing."

**Midwestern Markets . . .** Kaiser Aluminum & Chemical Sales, Inc., announced that U. S. Steel Supply, warehousing division of U. S. Steel Corp., has been appointed as a general line industrial distributor for Kaiser Aluminum products in Chicago, St. Louis and St. Paul.

**Quaker Controls . . .** The contract to engineer and supply the complete control system for the engineering test reactor, to be located at the National Reactor Test Station, Idaho Falls, has been awarded to Leeds & Northrup Co., Philadelphia instrument manufacturers. The award was made by Kaiser Engineers, prime contractor for the reactor's design and construction.

**It's Not Phony . . .** The U. S. Air Force has awarded two contracts, aggregating \$14,916,940, to the Luria Engineering Co. for the production of new-type, all-weather hangars to shelter intercontinental B-52 bombers and maintenance docks to service the B-52 bombers as well as C-124 and C-134 transport aircraft.

**Handy Around Home . . .** Carpenter Steel Co. has received a Community Service Award for its contributions to the growth, progress and welfare of its home community, Reading, Pa., over a period of years.

**English Accent . . .** Sintox ceramic oxides for metal cutting and other industrial applications will soon be in large scale production at a plant near Sintox Corp. headquarters, Allentown, Pa. Material is presently produced in England.

# FORGINGS

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**ROUND-SQUARE**  
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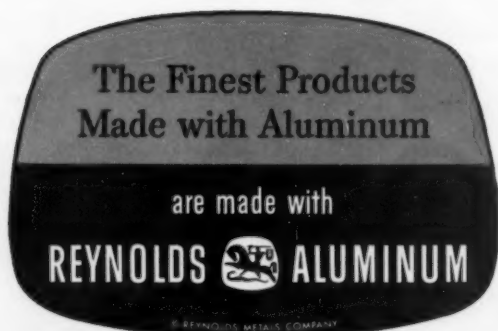
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## Horsepower Binge Hit By Governors

**State executives claim industry puts too much emphasis on speed, not enough on safety . . . Auto advertising conflicts with safety campaigns, but public wants bigger cars . . . Laws may follow—By T. L. Carry.**

♦ IT WAS MORE than coincidence that the state governors, conferring in Atlantic City, N. J., criticized high-powered automobiles at the same time the huge highway building program was passed by Congress.

The object of the new highways is to move increasing amounts of traffic from one city to another swiftly and safely.

The governors believe that there is altogether too much emphasis on the speed factor and not enough being said about safety.

**Legislative Threat . . .** They are fed up with the horsepower race that has been going on in Detroit for so long. They con-

tend, and perhaps rightly so, that public officials can't educate people to drive safely when just about every automaker in the business brags about product speed.

The auto industry would do well to take a second look at some of the remarks that were passed in Atlantic City. It should pay particular attention to the threat of limiting horsepower by law.

At the same time it is possible that the industry is not entirely to blame. Bigger cars with more and more accessories require more power. The industry claims that the public is demanding better performing cars and the only way to get them is to increase the amount of horsepower.

**Romance In Speed . . .** In short, the industry says that it is not in a power race just for the sake of power. Rather, it claims that heavier cars need more powerful motors.

There is also a question as to just how much of a factor speed is in fatal accidents. The industry quotes statistics that the majority of fatal accidents occur at speeds between 40 and 50 mph. Less than one-fourth of the nation's fatal accidents occur at above 60 mph.

This is all well and good but the fact still remains that the industry, intentionally or otherwise, is giving the public the impression that there is something romantic about the speed of an automobile.

**Gentlemen Agree . . .** Unfortunately, there doesn't seem to be much that can be done about it right now. For years there has been an unwritten gentlemen's agreement among the automakers that they would not sell their cars on speed. However, there is nothing wrong with selling them on performance and there is a fine line between the two that can be easily crossed.

The best way to measure performance of a car is by pointing out its horsepower and its speed. But the thing has gotten completely out of hand.

### GM Likes 'Em Young

Major changes in top management at General Motors Corp. reflect the company's attitude concerning young men in industry.

Edward N. Cole, formerly chief engineer of the Chevrolet Div., has been named general manager

## Excise Suspension Might Aid Unemployment

■ **Mothballing of the federal excise tax on cars, trucks, trailers and buses for 6 months would help greatly in relieving automotive industry unemployment, Sen. Potter (R-Mich.), told Congress.**

■ **He advocates congressional action to suspend the levy, now pegged at 10 pct on sales of these vehicles.**

■ **The suspension would cost the government about \$500 million initially but lower prices would boost demand and lead to rehiring of many workers.**

■ **Early losses to the treasury would be made up in income tax receipts, the senator figures.**

■ **Factory cutbacks in Michigan have resulted in layoffs of 220,000 persons, including those enterprises supplying and servicing the auto producers.**

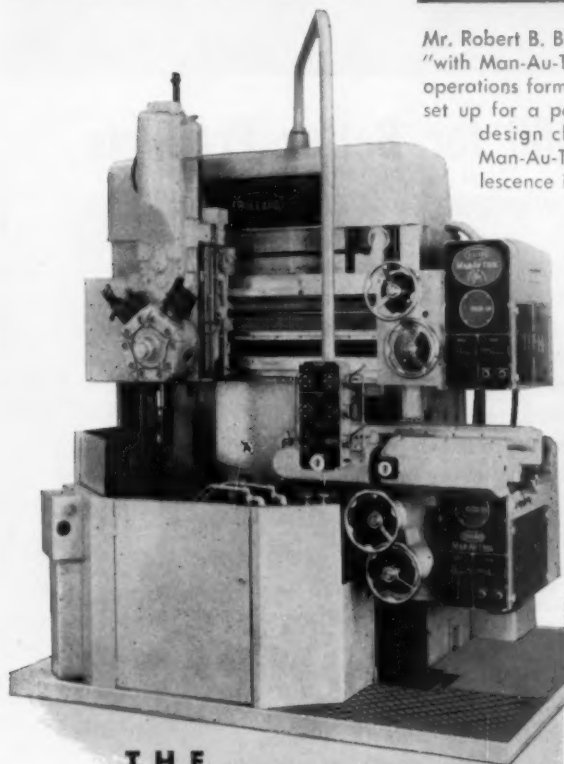
■ **Many of the unemployed have drawn nearly all the unemployment compensation available to them, said the senator.**



# PRODUCTION

## "at all time Peak"

Solar Aircraft Company of Des Moines, Iowa and San Diego, California, has found the versatility and flexibility of the Bullard Man-Au-Trol V.T.L., Model 75 a distinct advantage in the machining and fabricating of various jet aircraft engine parts and assemblies.



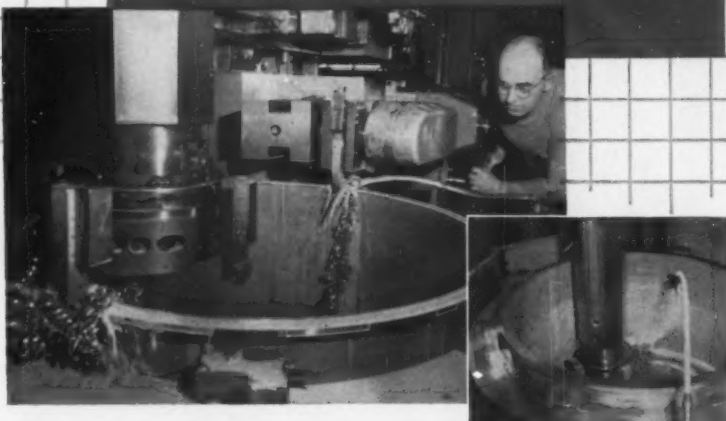
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# MAN-AU-TROL

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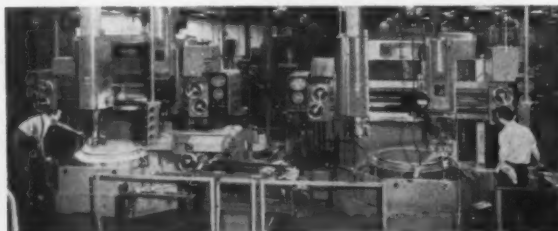
MODEL 75



Mr. Robert B. Ballard, Production Manager at Solar-Des Moines, reports that "with Man-Au-Trol, Model 75, it is possible to do a multitude of machining operations formerly requiring numerous expensive machines which had to be set up for a particular operation, so limited in scope, that an engineering design change either obsoleted the tooling or the machine. With Man-Au-Trol, Model 75, because of its wide range of functions, this obsolescence is greatly reduced — if there is a design change, only a new set-up is made — not the purchase of a new multi-thousand dollar piece of machinery."

These same advantages can be applied to your manufacturing methods —

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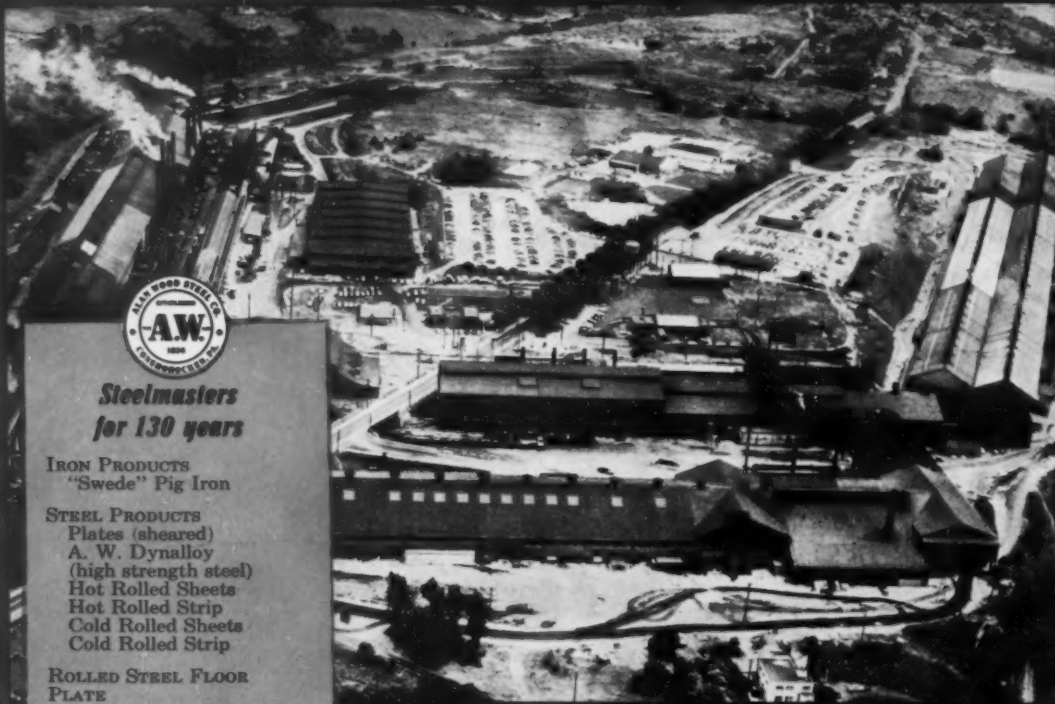
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In ten years, Alan Wood Steel has expended nearly \$50,000,000 for new rolling mills, furnaces, other additions and improvements to facilities, and for further development of a fully integrated operation. To our new customers and our old customers, this growth has meant new and improved products of such excellence as to reduce production and fabrication problems. Our planned expansion continues to supplement one of our greatest selling advantages—that of individualized attention to orders that Alan Wood's compact integration and flexibility make possible.

For detailed information on any Alan Wood product, write Marketing Division—Department AW-47.

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## Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
JULY 7, 1956	75,103	14,571
JUNE 30, 1956	112,265	22,738
JULY 9, 1955	143,400	23,888
JULY 2, 1955	166,733	28,338

\*Estimated. Source: Ward's Reports

of the division. S. E. Knudsen, formerly general manager of the Detroit Diesel Engine Div., has been appointed general manager of the Pontiac Motor Div.

Mr. Cole succeeds Thomas H. Keating, who has been named group executive in charge of the corporation's car divisions. Mr. Knudsen succeeds Robert M. Critchfield, who now heads the process development section at GM's Technical Center.

Both Mr. Cole and Mr. Knudsen are relatively young men as far as top automobile executives are concerned. But both have had a wealth of experience in all phases of manufacturing. So they are moving up the ladder and GM is in a position to take advantage of the broad experience of both Mr. Keating and Mr. Critchfield in more responsible positions.

As one Detroit observer puts it: "You have to give GM credit for having some of the smartest businessmen in the country. It's just like a Notre Dame football team. GM has management talent at least 5 deep and the fifth team is almost as good as the first."

## Production:

Rate 25 pct below last year. Big 3 still rule.

The industry passed the half-year mark with domestic production running at least 25 pct behind what it was in 1955.

Total domestic output for the first 6 months of this year was 3,193,895 compared to 4,257,154 in the same period last year.

One fact continues to stand out from the welter of statistics that are available. The Big Three are still dominating the market and

will continue to do so. Of the total number of cars produced in the first half, the Big Three accounted for 3,072,145 with the Independent producers making 121,750 cars.

The smaller companies continue to feel the effects of the highly competitive market. Packard has already ceased production of its 1956 cars.

American Motors Corp. is doing a little better than S-P. It is still making 1956 models and plans to bring out new cars on schedule in the fall. About 65 pct of AMC's production is centered on the Rambler. Chances are that if the company continues to outflank the Big Three, it will survive the onslaught and come up with at least 2 or 3 pct of the market.

In the meantime, production figures reflect the downturn in automobile buying for the whole industry. Nobody looks for a sizable pickup in output until the start of the fourth quarter.

The current drop in production could result in some changing attitudes by the various automakers. Although they wouldn't admit it at the time, company sales managers now agree that sales in 1955 were

## AUTOMOTIVE NEWS

extremely unusual for any year.

At the same time, they are clinging to the theory that last year reflected the underlying strength of the industry in future years. They now admit that it is almost impossible to have 2 years in a row as good as 1955.

Other factors are also being taken into consideration. The industry had no trouble selling its completely new cars this year—namely the Lincoln and Rambler. In addition, the Chevrolet, which had one of the best facelift jobs this year, is still leading the pack as far as sales are concerned.

Thus, Detroit has learned one lesson from slow sales this year. It is going to pay more attention to styling during facelift years. The automakers will still stick to minor changes, but will use more effective grill and fender treatments to at least make the cars look different.

As it stands this year, you can't tell the 1955 cars from the 1956 models without a scorecard.

## THE BULL OF THE WOODS

By J. R. Williams





## Have You Heard the Latest . . . production about the finest general purpose milling machines?

CINCINNATI ML and MI Milling Machines always were considered the finest equipment for toolroom work. Now they're better than ever before, and in addition, plain and vertical machines are available with or without automatic table cycles. And for a little more, automatic cycle machines can be equipped with automatic spindle stop. There you have the story in a nutshell.

Size, style and automatic features are related in the following manner:

New Nos. 2ML and 2MI Plain; built as toolroom millers, or as production millers with no loss of

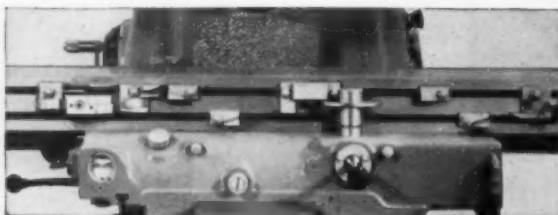
versatility. New Nos. 2ML and 2MI Universal; fine toolroom millers equipped with a new design Cincinnati Dividing Head (no automatic cycle). New No. 2MI Vertical; a toolroom miller, or production miller with no loss of versatility.

Three Cincinnati features of value in lowering your costs are illustrated here. Of course, there are many more, all of which are outlined in the new CINCINNATI 2ML and 2MI catalog, No. M-1916. Write for a copy, or telephone our nearest agent or office.

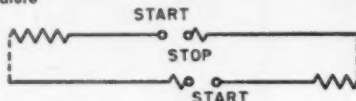
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A crank-type control at front of knee, makes selection of feeds quick and easy.



Automatic reciprocal milling setups, with center safety stop, may be assigned to Automatic Cycle Machines. That's because automatic backlash eliminator is a standard feature



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## Tax Cut Talk Now Is Pure Politics

**No chance for cut in taxes despite talk in Congress . . . Ike and Humphrey want \$2 billion surplus to go to debt reduction . . . Govt. is in black for first time since 1951, wants to stay—By G. H. Baker.**

♦ **SOME INFLUENTIAL** House Democrats are talking bravely of voting everybody a \$20 tax cut this year, but an unofficial count of noses in the House shows that they can't put it over this year.

The tax-cut hopes are based primarily on the glowing statement of Treasury Secretary Humphrey that we wound up the fiscal year on June 30 with a surplus of about \$2 billion.

But President Eisenhower and Mr. Humphrey insist that the surplus be used to pay something on the \$275 billion national debt. And key Republicans in Congress have pledged their support of this position.

**Reasons Why . . .** This is the main reason why a tax-reduction bill won't get to first base this year, but there are also a couple of lesser reasons:

1. In reasonably good times like these, there is no widespread demand for individual tax cuts. Therefore, it's advantageous to collect the maximum possible revenue and retire as much debt as possible during fair weather.

2. A \$20-per-person tax cut doesn't have a whole lot of political sex appeal. Better wait for an opportunity to make bigger cuts, and thereby to pass out refunds and to announce some lower rates that will actually bring smiles to the voters' faces.

**Financial Success . . .** Financially speaking, the Eisenhower Administration has just closed its books on an excellent year. In the 12-month period that ended June

30, the federal government took in more money and spent more money than it had anticipated, and at the same time found itself with a much bigger surplus (\$2 billion) than it had thought possible.

Fiscal 1956 was the first year in which the Eisenhower Administration took in more money than it spent. In only three other years (1947, 1948, 1951) in the past 26 has Uncle Sam kept his spending within his income.

**Need \$3 Billion . . .** Revenues have been piling up at the U. S. Treasury since early Spring at a surprisingly high rate—way over the Treasury's expectations. Politicians of both parties, eyeing this tidy pile of surplus money, are clamoring for lower taxes, but Treasury Secretary Humphrey is firmly opposed. He insists that the

surplus be used to reduce the \$275 billion national debt.

As for tax cuts, he urges the Congress to wait until the surplus grows large enough (he suggests \$3 to \$4 billion) to make everybody's tax cut "worthwhile."

### Red Tech Exchange

A small but highly selective exchange of technical experts between the United States and Russia is in the works.

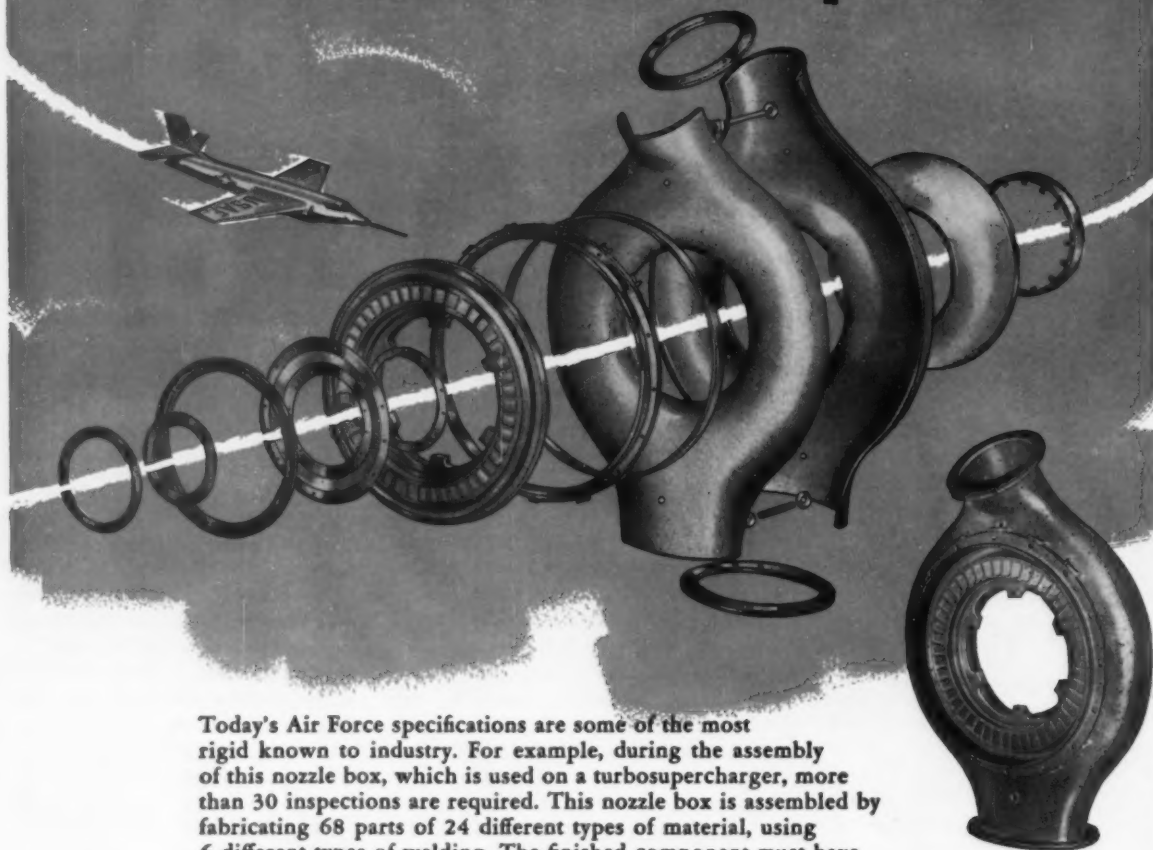
You can expect to see a gradual increase in the number of visiting Russian engineers and works managers in U. S. metalworking plants in the months ahead.

It's part of President Eisenhower's new plan for trying to breathe some new life into the faltering "spirit of Geneva" through the free exchange between this country and the Soviet of techni-

### What's the Future of Controls?

- For the next two years, the government will continue to exercise its powers to promote defense production, allocate scarce materials, and regulate exports.
- The Senate and House, have extended both the Defense Production Act and the Export Control Act for another two years.
- In the DPA extension, the Senators softened the tone of a provision declaring it to be the policy of Congress to "encourage," instead of "promote," dispersal of defense plants.
- Also removed was a clause which would have required businessmen recruited into the new executive reserve to make public their financial interests.
- While failing to adopt proposals calling for allocation of nickel in the civilian market, the DPA extension does require the Secretary of Commerce to make a full study of the situation.

# Amweld® Components Meet Air Force Specs



Today's Air Force specifications are some of the most rigid known to industry. For example, during the assembly of this nozzle box, which is used on a turbosupercharger, more than 30 inspections are required. This nozzle box is assembled by fabricating 68 parts of 24 different types of material, using 6 different types of welding. The finished component must have the same tensile strength and original characteristics as the parent metal.

Amweld, with its special ability to form, weld, size and machine rings, circular weldments and components, is geared to the manufacture of such complex parts.

Do you have a component assembly problem? If so, contact the Industrial Products Division of The American Welding & Manufacturing Co. today! They will be pleased to help you.

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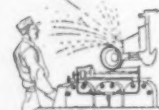
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cal, scientific, and cultural experts.

The Kremlin, meanwhile, drops hints that it, too, will be willing to open its doors just a little to selected groups of U. S. professional men, thus making the "loan" program an effective two-way street for the swap of technical information between the two nations.

Outlook, therefore, is for carefully-controlled increases in the visits of experts between the U. S. and the U.S.S.R. It's not expected that there will be any flood-tide of tourists traveling in either direction. Every application for travel will be carefully screened and submitted to the other nation for comment before being approved.

The U. S. State Department is opening a new bureau, the "Office of East-West Contacts," to process applications from U. S. businessmen who want to go to Russia. Interested parties should address communications to the Office of East-West Contacts, Department of State, Washington 25, D. C.

## Nickel:

### Pentagon ponders how to use less.

Frankly upset over its inability in the past two years to estimate accurately the nickel needs of defense contractors, the Defense Dept. is going to try again in revising requirements for the scarce metal in case of full mobilization.

Pentagon officials told a Senate subcommittee studying the nickel problem that they will turn over their revised estimated mobilization requirements of nickel to the Office of Defense Mobilization next month. But they admit that this estimate, on which ODM bases its stockpile and nickel expansion actions, will not be accurate unless recent "corrections" in their methods of computing nickel needs for current defense programs have made the system more accurate.

### Consistently Short

In 1955 and so far in 1956, the Pentagon's estimate of nickel needs has fallen far short of ac-

tual orders by defense contractors. Defense officials, along with the Commerce Dept. and ODM, expect new controls recently instituted over nickel alloys, when added to previous controls over stainless steel, aluminum, and copper, to help bring accurate advance estimates in the future.

But the only way corrected estimates can go, these officials say, is up as use of nickel in high-temperature alloys, electronic equipment, and jet and missile applications increases.

### Civilian Use Up

Robert C. Lanphier, Jr., Deputy Assistant Secretary of Defense for supply and logistics, adds that while military takes of nickel increase, so do civilian demands. He points out that use of priority nickel increased only 14 million lb from 1954 to 1955, but civilian demands required the government to divert 50 million lb of the metal from stockpile deliveries in 1955.

The nickel scarcity, Mr. Lanphier says, has not yet caused any slowdown in defense construction, because military contractors under the priority system have been getting first call for the metal.

The Pentagon is stepping up its

## WASHINGTON NEWS

efforts to force conservation of nickel by improving use of available nickel, by stopping the building of unneeded quality into designs and by seeking substitutes where possible.

### Freight Plan Shelved

Planned changes in national transportation policy, proposed as stimulants to greater common carrier competition and possible sources of lower rates for shippers, are officially placed on the Congressional shelf until January.

A House commerce subcommittee has ordered its staff to have ready for the new Congress an analysis of the recommended changes and the stands taken on them by affected groups. The subcommittee has had the proposals before it since September, 1955.

Railroads and truckers are at odds over many points in the policy recommendations made last year by a cabinet committee headed by Commerce Secretary Sinclair Weeks.

## Wilson Won't Be Rushed

◆ DEFENSE DEPT., despite renewed warnings from air leaders that Russia is closing the air power gap with this country, will not rush to spend the extra \$900 million Congress has forced on the Administration for stepped up aircraft procurement.

Defense Secretary Wilson has publicly disagreed with testimony of his air chiefs before Congress that Russia has more planes than this country and is rapidly closing the gap in quality. Gen. Nathan Twining, Air Force chief of staff recently back from a tour of the Russian aircraft industry, says he still believes that this country is in danger of falling behind.

But Mr. Wilson, during several days of heated questioning by a Senate Air Force subcommittee,

says that he is certain that the Free World alliance is still ahead of the Soviets in the number of planes, and far ahead in quality.

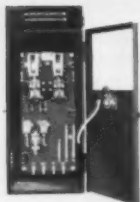
The lawmakers, led chiefly by Democrats, raised the Air Force budget by \$900 million over Administration objections, and are now demanding an explanation of "inconsistencies" between the defense secretary and his staff over the relative position of Russia and the U. S. air strength.

Most of the \$900 million extra appropriation was aimed at forcing a speedup in production of the B52 intercontinental jet bomber. Mr. Wilson says the projected rate of delivery of 20 a month is at present sufficient, and that the extra funds will be spent "only as needed."

## For faster load discharge...low cost operation...longer life...

EC&M Magnet Controllers have earned a reputation for improved magnet operation. Loads are discharged quickly...cleanly...without "dribble". Magnets "work more" because faster drops eliminate "positioning" the magnet at point of discharge.

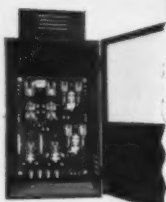
A simple two-position (lift-drop) Master Switch makes operation easy...power is off when the master switch is in the drop position. This prevents overheating, keeps lifting capacity high, and substantially adds to magnet life.



For single magnets or two magnets in parallel...Type AD STANDARD Controller has exclusive adjustable discharge feature for different type loads. (dial on door).



BOOSTER Controller gives increased pull-away power from pile, then carries load at reduced current.



HIGH SPEED RELEASE DLM-335-A Controller reduces discharge time of deep-type magnets 50%.

EC&M Controllers may be used with all types and makes of magnets.



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## Construction Spending Will Spur Boom

**Proposed six-year, \$6 billion public works program in Calif. will benefit metalworking there and across country . . . West Coast plants won't be able to handle job alone even with planned expansions—By R. R. Kay.**

♦ **ONE HUNDRED MILLION DOLLARS** every thirty days for five years! And that's not a giveaway. California's Gov. Goodwin J. Knight proposes to spend \$6 billion from now until 1961 for public works construction—all projects that demand huge amounts of metalworking products and services.

Even for optimistic Farwesterners, it's an eye-opener. The Governor calls it "the most ambitious general long-range undertaking of its kind ever planned in all of California's history."

But the plain fact is this: metalworking here simply won't be able to handle the whole job, not even when already announced plant expansions come into use.

**Share For All . . .** This will happen when the program gets rolling:

(1) California will become an even bigger spender all across the country. It will shell out hundreds of millions of dollars to get what it needs. And almost every segment of metalworking and metal producing will come in for a share of the business.

(2) There'll be a new big boost to the industrial boom here. More of the nation's plants will want to produce right in the heart of the expanding market.

(3) All this means hundreds of thousands of new paychecks for California. With more consumer dollars around, makers of consumer goods, too, are sure to swarm like bees to the honey.

**How It's Divided . . .** Here's how

Governor Knight proposes to spend most of the \$6 billion: \$1 billion for highway and freeway construction and maintenance; \$1 billion in veterans homes and farms; \$870 million on the Feather River project; \$850 million for dams, reclamation, and flood control work; \$500 million for public buildings: universities, colleges, mental hospitals, penal institutions, state office buildings; and \$500 million for schools.

California expects to ante up 75 pct of the \$6 billion. The rest will come from the Federal government.

### Busy Engineers Happier

Keep your engineers happy by letting them do engineering. That's one sure way to hold them.

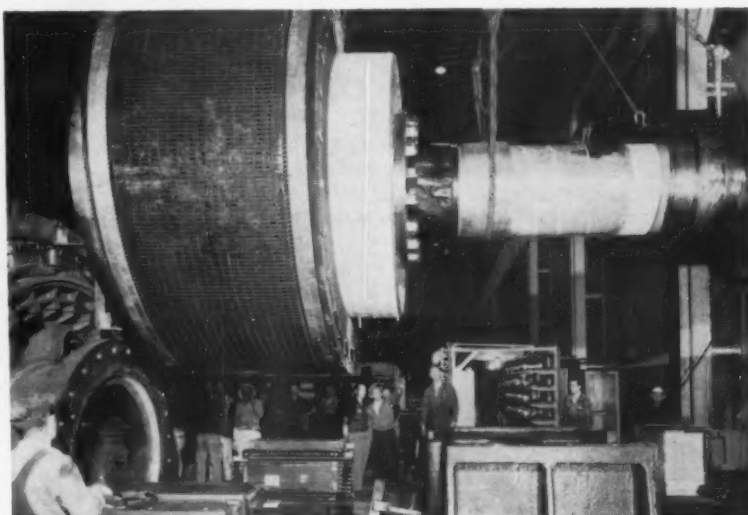
And here's proof: One large firm here discovered that 90 pct of their engineer "quits" was due to frustration rather than money. Why? Engineers want to do true engineering. They're irked by time-consuming paper work.

### Missile's Better Side

Right now, missile development is for military defense. But let's not overlook the byproducts that will be useful in our civilian economy. Courtlandt S. Gross, Lockheed Aircraft Corp.'s executive vice president, sees many dividends accruing to industry:

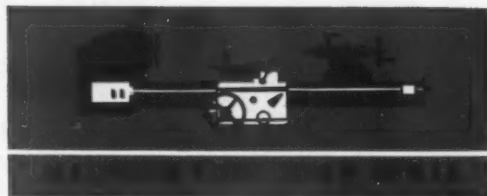
(1) Materials and processes adaptable to civilian use.

(2) Guidance, control, and computing techniques applicable to industrial processes.



**DOWN TIME RECORD** for one of the largest motors in the world is broken as this new armature is lowered into place at U. S. Steel's Geneva Works. Pre-assembly enabled engineers to cut maintenance time from 10 to 5 days.





## Card System Pinpoints Machine Repairs

Complete record kept at Westinghouse on mechanical and electrical failures to any of 12,000 production facilities . . . Method permits close watch on charges, spotlights excessive maintenance—By E. J. Egan, Jr.

♦ AT THE END of a business year, you can probably tell to a penny how much it cost to repair and maintain any given machine tool in your plant. But—where there were breakdowns or failures—do you know what caused them?

A card that only shows the annual labor and repair-material cost charged to a machine means you're not being fair to yourself. You're not getting the full story of what made these charges necessary in the first place.

**The Big Four . . .** For example, do these costs mean that:

(1) The machine has an inherent weak spot? Maybe you'd better not order any more of that model unless you're sure it has been redesigned.

(2) The machine is just plumb worn out? If it is actually eating you up each year, you'd be money ahead to get rid of it and buy a new one.

(3) The machine is being mis-used or mistreated to the point that something's got to give? If so, it shouldn't take long to put a stop to these malpractices.

(4) You're scrapping and replacing large assembly components of machines when perhaps only a small item is the trouble source? This can run into real money.

**Just the Facts . . .** A while back, Westinghouse Electric Corp. realized the need for detailed records on machine tool failures, set up a system to code repair information for quick tabulation and fact-finding answers.

First step was to classify electrical and mechanical subassemblies on all types of production equipment. This produced 29 electrical and 41 mechanical classifications.

Each subassembly group was then reclassified for common types of parts. Result was 67 distinct types of mechanical parts and 37 electrical. Next was the cataloging of 15 major reasons for failure.

**Reasons in Brief . . .** Outcome was that the firm could describe 15 different reasons for the failure of 12,000 individual production facilities, using a vocabulary of only 189 terms. Each time a repair is made on a facility, the repair man notes on the machine's card the

code numbers for subassembly, part, reason for failure and action taken.

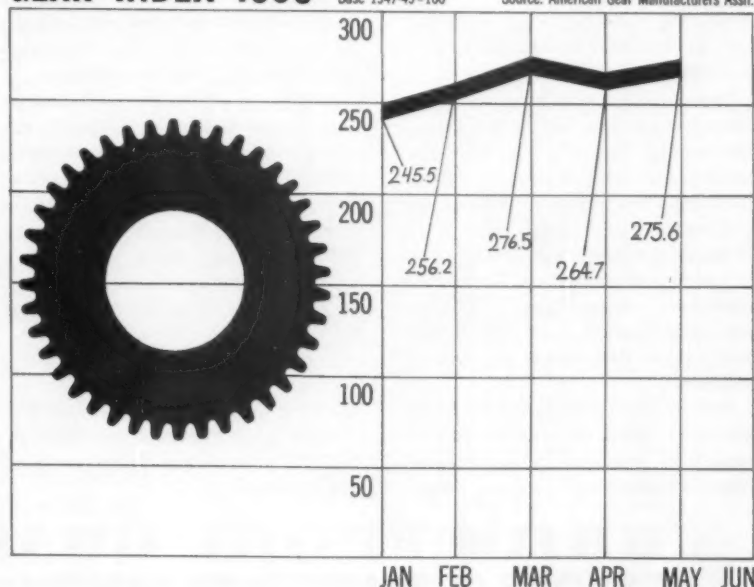
Labor cost, material cost, total cost and accumulated total are also recorded for each repair made. Accumulated total is marked by a movable green tab on the bottom of the card. If it eventually bumps into a red tab set at a pre-established budget limit for normal annual maintenance, the card is pulled for investigation.

**Decade of Data . . .** Reverse side of repair card accommodates a 10-year record of repair and maintenance costs which are entered semi-annually. This continuing record points up gradual or sudden increases in dollar totals.

## GEAR INDEX 1956

Base 1947-49=100

Source: American Gear Manufacturers Assn.



# BRIDGEPORT BRASS COMPANY

# COPPER ALLOY BULLETIN

BRIDGEPORT  
CO.

Reporting new developments in copper-base alloys and metalworking methods.



## Bridgeport Alloys Used for Heart of Transmitting Tubes

Today's rapid developments in radar and communications give increasing importance to the electron tube for generating and amplifying ultra-high and microwave frequencies for radar and communication systems.

In manufacturing electron tubes, Eitel-McCullough, Inc. of San Bruno, California—a leading producer of transmitting tubes—faced several difficult problems. The primary problem was that vacuum tube production requires firing at extremely high temperatures in a hydrogen atmosphere. Under these conditions, ordinary copper becomes spongy and porous. Specifying Bridgeport Oxygen-Free copper provides the solution.

Other major requirements for metals also exist. While the majority of electron tube components are formed, many are machined to exact dimen-

sions from rod and tube. Eitel-McCullough requires a metal that can be easily fabricated in deep-drawing, is a good electrical conductor and is adaptable to plating. Here, too, Bridgeport alloys proved to be the solution.

Bridgeport alloys are used because they can meet Eitel-McCullough's exacting requirements in manufacturing and finished product performance, as well as providing consistently uniform composition. Bridgeport O.F.H.C. copper is used for many tube parts— anodes, support structures, coolers, cooler cores, drift tube sections, index sleeves and static sleeves.

Transmitting tubes are one of many products using Bridgeport Alloys for special applications. Your product, too, can use Bridgeport "job matched" alloy. Call your nearest Bridgeport sales office today.

## The Importance of "Machineability"

Low-cost, large-volume production depends on the "machineability" of the metal used to do the job. In establishing the machineability ratings of alloys, Bridgeport Metallurgists consider these five factors the most important: speed of machining... tool life... finish... accuracy... and power required.

While copper and each of its alloys have individual characteristics, Bridgeport copper-base alloys have been grouped into three broad machineability classifications:

### Free-Cutting Alloys

Machineability rating 100% to 70%. All alloys in this group are leaded, and produce short, brittle chips. For example, most jobs that call for free-cutting brass rod can be entrusted to Bridgeport Ledrite #6 Standard, machineability rating of 100%. Ledrite #6 is easy to cut, gives longer tool life... products are smooth, clean-surfaced.

### Moderately Machineable Alloys

Machineability rating 70% to 30%. This group covers some leaded refractory alloys and some non-leaded brasses. Bridgeport Duronze III, a silicon aluminum bronze, is also included in this classification.

### Difficult to Machine

This group includes non-leaded copper, phosphor bronze, silicon bronze, nickel silver and commercial bronze. All produce long, tough, stringy chips.

Finding the right metal or alloy, with the right machineability rating is no chore—if you call Bridgeport. Close cooperation with our Technical Service Division has worked wonders for many fabricators—increasing quality and uniformity, reducing waste, cost of labor and materials. Write or call your nearest Bridgeport Sales Office for high-quality alloys, and for free expert advice in your metal selections. (1155)



**BRIDGEPORT BRASS**  
COMPANY ♦ BRIDGEPORT, CONNECTICUT

Mills at Bridgeport, Conn.,  
Indianapolis, Ind., and Adrian, Mich.  
Sales Offices in Principal Cities—  
Conveniently Located Warehouses





## The Iron Age

# SALUTES

**Raymond A. Gierlich** As head of DoAll's gage research and development laboratory he draws the fine line of precision measurement to seven decimal places. His aid to a friend in need is a lesson in character building.

To Raymond A. Gierlich, it's the little things in life that count. As head of DoAll Company's gage research and development program, he has smoothed gage accuracy out to seven decimal places, produced surface finishes of less than 0.1 microinches and refined precision manufacturing techniques to such an extent that his company revised its entire system of gage block standards.

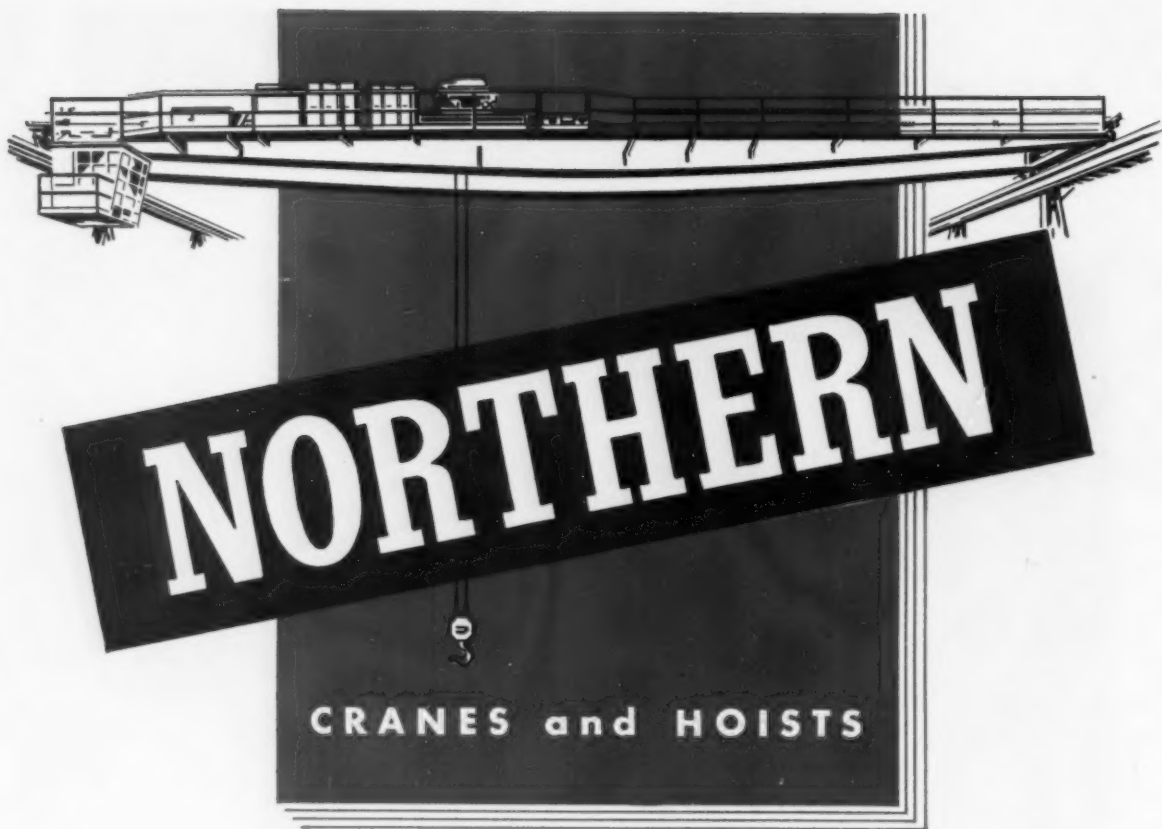
When he joined DoAll in 1942, it became apparent that he possessed a rare combination of talents—artistry, mechanical intuition and command of the scientific method. In his drive to make small errors smaller, Ray has come to be known as a metrologist's metrologist. In some quarters, he is even regarded as a kind of secret weapon.

The U. S. Bureau of Standards studies his laboratory standards developments with considerable respect. And with tolerance requirements for precision military equipment growing finer each year, Ray's work has played a

large part in enabling the gagemaking industry to keep pace. For instance, his research on removal of lapping burrs from gage surfaces and the effects of clamping pressure on gage accuracy are projects as vital to national defense as the atomic stockpile.

The father of three grown children, Ray makes his home in Shakopee, Minn., where he spends his evenings repairing watches and jewelry. Even in this field he has passed the layman's test of a true technician. When Ray Gierlich takes a clock apart and puts it together again, it works—no parts are left out.

Not too long ago, he learned that a neighbor—a young father—had been paralyzed from the waist down in an auto accident. Ray encouraged him to study watchmaking and spent several nights a week, for 18 months, teaching him the trade. Now the young husband operates his own jewelry and watch repair shop. Helping the fellow was just a little thing to Ray Gierlich. Little things are his specialty.



## *Look Overhead...* **See "NORTHERN"**

"NORTHERN" — the name you see on overhead electric cranes in industrial plants of all kinds wherever you may be, because NORTHERN — since 1899 — has been a leader in industrial crane design and construction.

The name "NORTHERN" represents faithful adherence to uncompromising design, quality controlled machining, and closely inspected fabrication. "NORTHERN" Cranes and Hoists have an extra margin of safety — give dependable, fast service under the most rugged, emergency conditions — are notable for fine, standard-type electrical equipment and controls for precise manipulation and quick, easy maintenance with minimum downtime.

Let us send you Crane Bulletin SE-108-A, Hoist Bulletin H-112

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210 CHENE STREET, DETROIT 7, MICHIGAN

OVER 50 YEARS BUILDERS OF MATERIAL HANDLING EQUIPMENT

## The Iron Age INTRODUCES

**Fred L. Shanklin**, appointed president, **Union Carbide Ore Co.**, Div. of Union Carbide and Carbon Corp., N. Y.

**E. D. Wilgus**, appointed vice president and general manager, **Aviation Developments, Inc.**, Burbank, Calif.

**J. Robert Jones**, elected vice president, sales, **Kearney & Trecker Corp.**, Milwaukee; **H. W. Kippers**, named sales manager, **Standard Machinery Div.**

**Harry C. Lynch**, elected vice president, engineered products, **The Wellman Engineering Co.**, Cleveland.

**John J. McGlone**, elected vice president, **Williams Bucket Div.**, **The Wellman Engineering Co.**, Cleveland.

**W. L. Komph** and **F. J. Theisen**, elected vice presidents, **Anker-Holth Div.**, **The Wellman Engineering Co.**, Port Huron, Mich.

**Cresswell Ramsey**, elected vice president, production, **The Wellman Engineering Co.**, Cleveland.

**A. H. Jackson**, elected vice president and general manager, **Equipment Div.**, **Blaw-Knox Co.**, Blawnox, Pa.

**Harry W. Siefert**, elected ass't treasurer, **Alan Wood Steel Co.**, Conshohocken, Pa.

**Weldon D. Willes**, named assistant to president, **Locomotive Finished Material Div.**, **Rockwell Manufacturing Co.**, Atchison, Kansas.

**R. L. Huey**, named controller, **Stran-Steel Corp.**, Ecorse, Mich.

**Kenneth N. Bundy**, appointed ass't superintendent, **By-Product Coke Plant**, **Wheeling Steel Corp.**, Wheeling, W. Va.

**Percy S. Gough**, named sales manager, **Crosby-Laughlin Div.**, **American Hoist & Derrick Co.**, St. Paul, Minn.

**William O. Hoverman**, named manager, sales, **Semiconductor Products Depts.**, **General Electric Co.**, Syracuse, N. Y.

**Dr. Robert O. Fehr**, appointed manager, **Mechanical Engineering Lab.**, **General Electric Co.**, Schenectady, N. Y.

**John A. Johnson**, appointed division manager, **Athenia Steel Div.**, **National-Standard Co.**, Clifton, N. J.

**H. R. Godfrey, Jr.**, named ass't to general manager, **Allis-Chalmers Products Div.**

**Thoburn P. Sands** and **William B. Hicks**, appointed section manager, **Development Dept.**, **Organic Chemicals Div.**, **Monsanto Chemical Co.**, St. Louis.

## PERSONNEL



**CARL W. PETERSEN**, elected executive vice president, **Dodge Manufacturing Co.**, Mishawaka, Ind.



**EARL WEDLAKE**, elected vice president, production and purchasing, **Dodge Manufacturing Co.**, Mishawaka, Ind.



**KARL W. MUELLER**, elected vice president and director, marketing, **Crown Cork & Seal Co., Inc.**, Baltimore, Md.



**WALLACE B. HUNTER**, elected vice president, contracting, **American Bridge Div.**, **U. S. Steel Corp.**, Pittsburgh.

**Now, more than ever  
you can depend on**

# HANNA

**as your best source for**

# PIG IRON

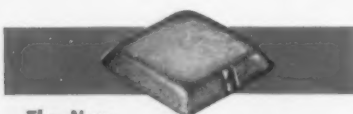
- ▶ **Our merchant capacity  
is bigger than ever**
- ▶ **Our plant is  
better than ever**
- ▶ **Our product range  
is greater than ever**

**It includes:**



### The HANNA 38-POUND PIG

The foundryman's favorite standard pig. Available in all grades, silvery and HannaTite. A good example of the quality that has made Hanna "the best known name in iron."



### The New EXCLUSIVE HANNATEN INGOT

For 10-lb.-pig users, this new ingot means no free-carbon pockets, finer grain structure, more even melting. Available in all grades, silvery and HannaTite — an extra-close-grain iron.

### THE HANNA FURNACE CORPORATION

Buffalo • Detroit • New York • Philadelphia  
Merchant Pig Iron Division of

**NATIONAL STEEL CORPORATION**



## PERSONNEL

Edward L. Hradesky, named sales coordinator, Guided Missile Program, Loewy-Hydropress Div., Baldwin-Lima-Hamilton.

Harold A. Berry, named manager, purchases and stores, Rock Island & Pacific Railroad Co., Chicago.

William Hanson, Jr., named manager, conveyor products, Philadelphia plant, Joy Mfg Co., Pittsburgh.

Harold A. Strickland, Jr., named general manager, Industrial Electronics Div., General Electric Co., New York.

L. Berkley Davis, named general manager, Electronic Components Div., General Electric Co., Owensboro, Ky.

Dr. George L. Haller, named general manager, Defense Electronics Div., General Electric Co.

Robert L. Gibbs, named general sales manager, Mueller Brass Co., Port Huron, Mich.

E. W. Gilmore, named branch office manager, Tulsa, Okla., office, Kaiser Aluminum & Chemical Sales, Inc., Chicago.

K. A. Saunderson, named customer service manager, Los Angeles plant, Drake Steel Supply Co.; Robert Bushey, named manager, inside sales.

John W. Majewski, named assistant sales manager, J. H. Wood Co., Philadelphia.

Fred E. Rau, named manager, hoisting equipment sales, Yale Materials Handling Div., The Yale & Towne Mfg. Co., Philadelphia; Robert L. Brown, Jr., named electric truck sales manager, Philadelphia; William S. Woodward, named district sales manager, hoisting equipment, New York territory; William B. Hood and John H. Eichert, named assistant hoist sales managers, Yale Materials Handling Div.



HAROLD A. MUTTACH, elected assistant to vice president, operations, Granite City Steel Co., Granite City, Ill.



WILLIAM L. McCULLA, named chief engineer, Superior Steel Corp., Carnegie, Pa.



DAVID P. HUGHES, named chief metallurgical engineer, Latrobe Steel Co., Latrobe, Pa.



RAY MACK, elected vice president, Locomotive Crane Div., Wellman Engineering Co., Cleveland.



# NOISY GEARS ELIMINATED AUTOMATICALLY

A consistent electronic ear in the Red Ring Gear Speeder has replaced the human sense of hearing which, as we know, varies with the fatigue and mental attitude of the listener.

This electronic sound discriminator is readily adjusted to reject gears at any point within the range of audible noise frequency and intensity.

The Model GSR Speeder for gears and pinions in the smaller sizes is fully automatic. Gears are loaded, run in both directions, with and without a brake load and are either passed or rejected by the electronic sound discriminator as a continuous operation. *Write for Details.*

SPUR AND HELICAL GEAR SPECIALISTS  
ORIGINATORS OF ROTARY SHAVING  
AND ELLIPTOID TOOTH FORM

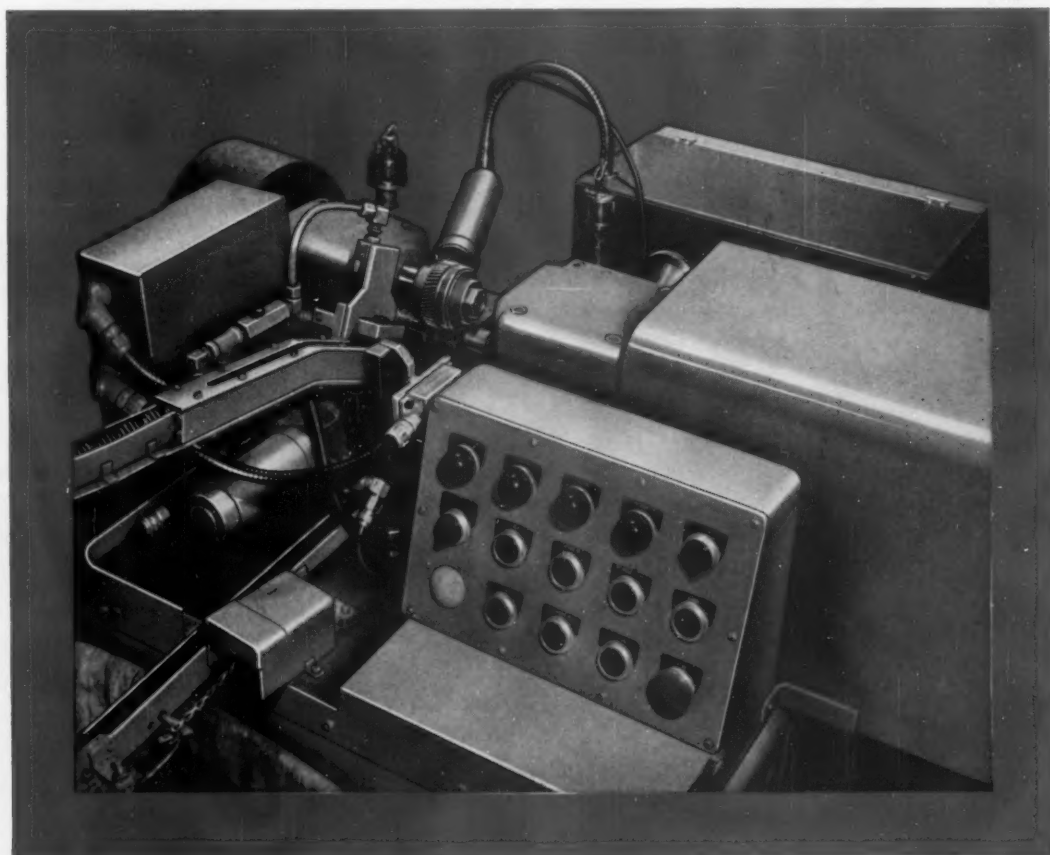


## NATIONAL BROACH & MACHINE CO.

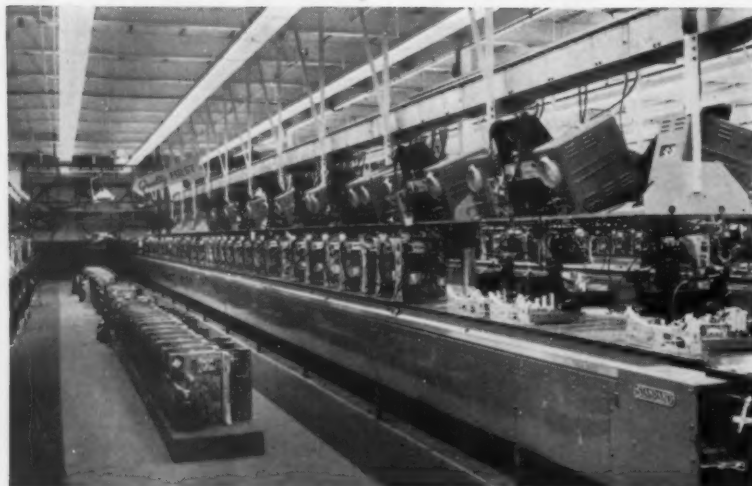
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WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

7547



# Ask *how to* Standard *cut costs with* *conveyors*



TV chassis move along Standard slat conveyor at right center. Job-tailored design assures uninterrupted, smooth work flow . . . helps manufacturer achieve high degree of automation despite complexity of operations.

## Mile-long conveyor system speeds TV production line

**I**n this TV plant, Standard engineers designed and installed more than 2800 ft. of belt and slat conveyors as part of a mile-long conveyor system.

It's a typical example of how Standard engineers will work with you and your engineers to increase automation, cut costs through more widespread use of conveyors.

And, because Standard produces a

wide range of permanent or portable gravity and power conveyors — in roller, belt, slat, chain, wheel push-bar and sectional types — you can be sure their recommendations will be unbiased. When you plan any materials moving system, be sure to call or write STANDARD CONVEYOR COMPANY, General Offices: North St. Paul 9, Minnesota.

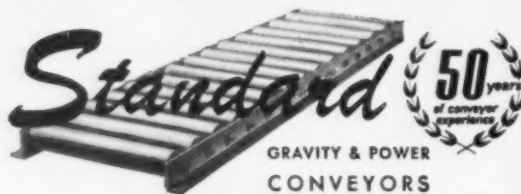


Left photo shows closeup of slat conveyor. Note integral electric sockets for circuit testing. At right, completed sets move along Standard wire-mesh floor belt.



Contact the Standard engineer listed in your classified phone book. Or, write for free catalog.

Address Dept. M-7.



Sales and Service in Principal Cities.

## PERSONNEL

George R. Buchanan, Jr., appointed associate manager, petroleum chemicals sales, Organic Chemicals Div., Monsanto Chemical Co., St. Louis.

Frank J. Vuranch, named chief engineer, Foundry Equipment Co., Cleveland.

Fred W. Hartlage, appointed sales promotion manager, Pioneer Engineering Works, Inc., Minneapolis.

Raymond W. Puterbaugh, appointed general sales representative, Inland Steel Products Co., Milwaukee.

Carl E. Seterstrom, appointed sales engineer, Inland Steel Products Co., Milwaukee.

B. J. Manno, named eastern sales representative, Plastic Div., The O'Sullivan Rubber Corp., Winchester, Va.

Elmer O. Corbin, appointed general superintendent, operations, Oldsmobile forge plant, Div. of GMC, Lansing, Mich.

Robert R. Stough, appointed sales engineer, Precision Metal-smiths, Inc., Cleveland.

G. N. Stuart, appointed production manager, Western Brass Mills Div., Olin Mathieson Chemical Corp., N. Y.

John R. Jones, appointed sales manager, The Pioneer Rubber Co., Willard, Ohio.

## OBITUARIES

Carl J. Snyder, vice president, operations, Chrysler Motor Corp.

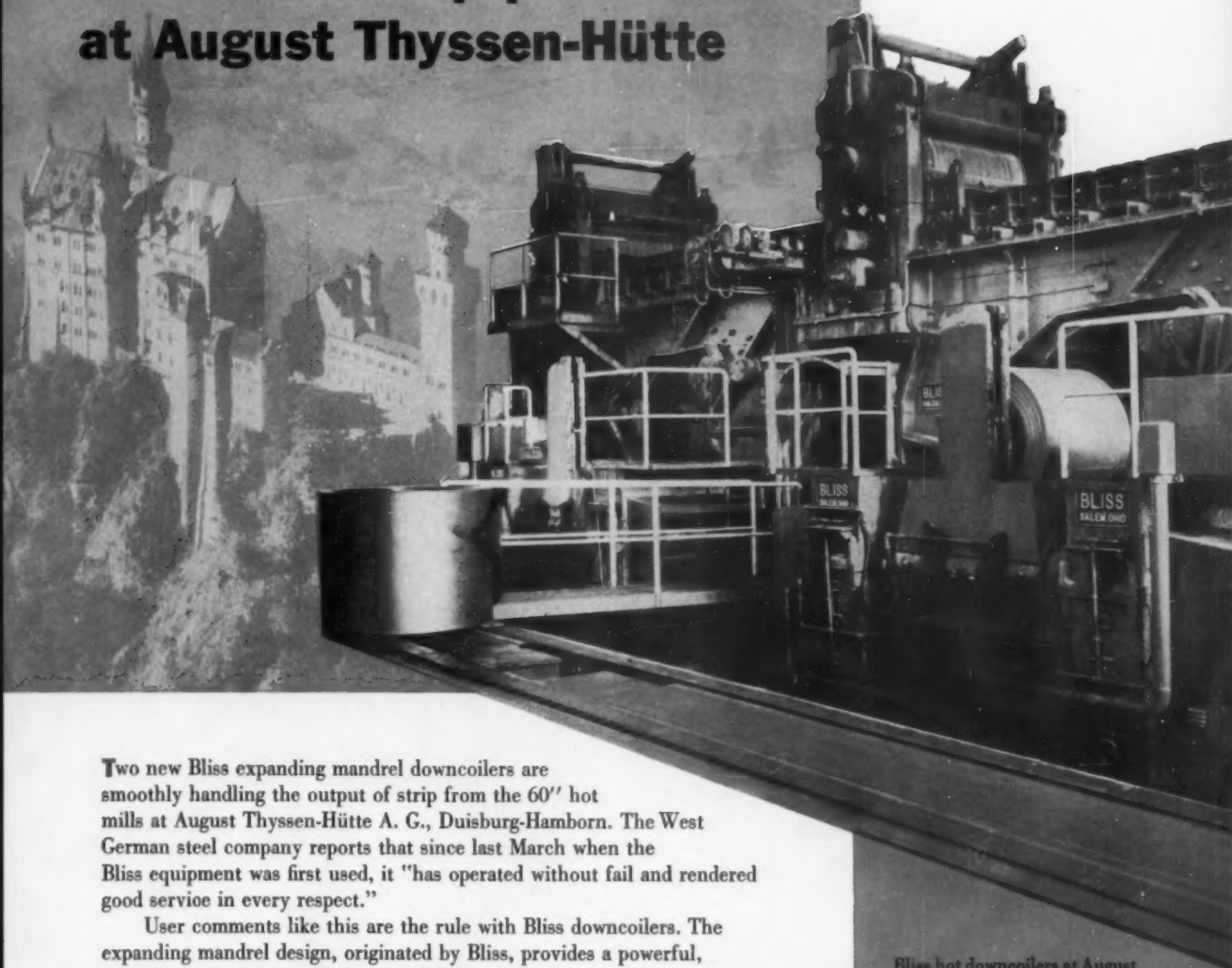
C. B. Thomas, 61, vice president and director, Chrysler Corp., and president of its Export Div.

Arthur A. Williams, 78, chairman of the board, Graton & Knight Co., Worcester, Mass.

R. E. Christie, vice president, Crucible Steel Co. of America, Pittsburgh.

**In Germany:**

## **two new Bliss downcoilers insure hot strip production at August Thyssen-Hütte**



Two new Bliss expanding mandrel downcoilers are smoothly handling the output of strip from the 60" hot mills at August Thyssen-Hütte A. G., Duisburg-Hamborn. The West German steel company reports that since last March when the Bliss equipment was first used, it "has operated without fail and rendered good service in every respect."

User comments like this are the rule with Bliss downcoilers. The expanding mandrel design, originated by Bliss, provides a powerful, smooth-as-silk coiling action that winds tight coils with even edges. The blocker rolls touch the strip only when the initial wraps are made and the ends are being taken up. Thus, there is no scratching or surface damage during coiling.

You'll find Bliss equipment... and satisfied users... in rolling mills all over the world. To acquaint yourself with our products, why not write today for a copy of our 60-page Rolling Mill Brochure, Catalog 40-A? It's yours for the asking.

### **E. W. BLISS COMPANY**

General Office: Canton, Ohio

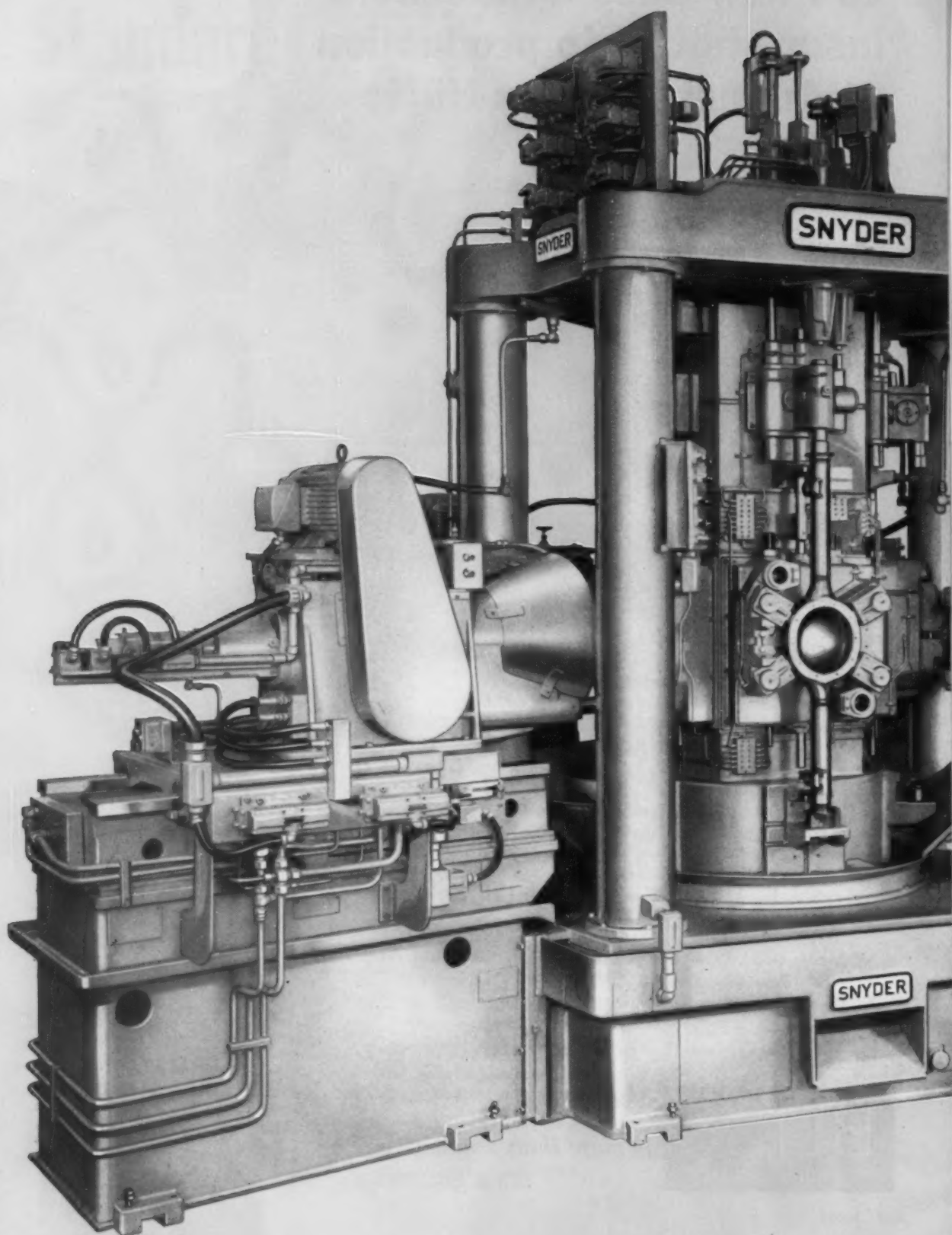
ROLLING MILL DIVISION: SALEM, OHIO

**BLISS**  
SINCE 1857

*is more than a name...  
it's a guarantee*

Bliss hot downcoilers at August Thyssen-Hütte coil strip in widths from 24" to 60". Mandrel diameter is 28", and maximum coil O.D. is 56". The two upenders were also designed and built by Bliss.

**PLANTS:** Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Mich.; Pittsburgh and Midland, Pa.; San Jose, Calif. In Europe: E. W. Bliss (England) Ltd., Derby; E. W. Bliss Co. (Paris), France.





# **SNYDER VERTICAL TRUNNION MACHINE**

**for processing rear axle housing  
assembly; rough and finish faces  
banjo face, combination drills  
and reams ten holes in banjo  
face and chamfers both sides of  
holes. Production: 105 pieces  
an hour at 100% efficiency.**



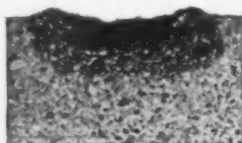
# **SNYDER**

**TOOL & ENGINEERING COMPANY  
3400 E. LAFAYETTE • DETROIT 7, MICHIGAN**

*31 Years of Special Machine Tools with Automation*

## ACTION of MOLTEN ALKALI

on high duty  
Fireclay Brick



and on KAOSIL



LINEAR SUBSIDENCE  
in the  
standard load test  
for SUPER-DUTY  
Fireclay Brick  
Load 25 lb./sq. in.  
Temperature 2640°F.

0	KAOSIL 0 to 2%		
2		Typical SUPER-DUTY Fireclay Brick 2 to 6%	
4			
6			Typical HIGH DUTY Fireclay Brick 6 to 12% or higher
8			
10			
12			

## These illustrations show why Harbison-Walker **KAOSIL** excels for many furnace requirements in iron and steel plants

**T**HE remarkable resistance of KAOSIL to corrosion in atmospheres containing volatile alkalis, contributes greatly to its successful use in Blast Furnace Stoves. The photographs above show the results of five hour cup tests with sodium carbonate at 2550°F. While some erosion occurred with both brick, there was a great difference in the degree of penetration. The aluminous High Duty fireclay brick was deeply penetrated and corroded, while KAOSIL was not penetrated beyond the zone of erosion and the cup still held the glass.

Among applications for which KAOSIL is especially suited are: *Blast Furnace Stoves*—combustion wells, domes, checkers; *Soaking Pits*—sidewalls, regenerator arches, top courses of checker chamber walls, and covers; *Open Hearths*—fantail roof, regenerator roof, side walls above checkers, checker arches; *Heating Furnaces*—suspended or sprung arch roofs, walls; *Hot Metal Mixers*—above metal line; *Miscellaneous*—piers under load in soaking heats—in heavily insulated arches and walls—arches of unusually wide span.



### a SEMI-SILICA fireclay refractory of superior quality

1. Kaosil is made with hard-fired siliceous kaolin of exceptional purity. (Silica 75 to 76%—extremely low alkali content—less than 1/2%).
2. Kaosil is formed by the power-press method which provides uniform texture, free from laminations—and assures superior workmanship.
3. Kaosil remains rigid and does not become pyroplastic nor shrink in soaking heats up to its temperature limit.
4. The temperature of incipient vitrification of Kaosil is higher than that of the best aluminous high duty fireclay brick. This property contributes to its excellent spalling resistance.
5. In atmospheres containing volatile alkalis at high temperatures, Kaosil becomes glazed and penetration is thereby greatly retarded.



**HARBISON-WALKER REFRACTORIES COMPANY**  
AND SUBSIDIARIES  
World's Most Complete Refractories Service  
GENERAL OFFICES: PITTSBURGH 22, PENNSYLVANIA



## H-Iron: Competition For The Blast Furnace?



♦ The H-Iron process directly reduces iron ore fines with hydrogen and does it efficiently, cheaply . . . That's why it's attracting the attention of almost every sizeable steel producer in the U. S.

♦ Not an outright substitute for the blast furnace, it is bound to give some of the older steelmaking techniques stiff competition . . . The end product—metallic iron—fills the needs of both open hearth and electric furnace practice.

By P. M. UNTERWEISER, Metallurgical Editor

♦ A RECENT TREND in the metalworking industry rates high in both technical and dollars-and-cents significance. It is the gradual—but extremely forceful—infiltration of chemical engineering into territory that was almost exclusively metallurgical.

This revival of chemical "know how" in the metals industry isn't accidental. It is dictated by the urgency of immediate requirements. And it is helping to drive home the point that no one—least of all the metals industry—can afford to sell chemical engineering short.

Vacuum melting on a production basis is one of the fairly recent contributions of chemical engineering (THE IRON AGE, Jan. 26). So, too, are some of the later modifications of titanium refining and the production of rare metals in appreciable quantities. Other accomplishments include vacuum heat treating and dozens of fringe developments associated with metallurgy's "new look."

Many of these developments are impressive—technically and economically. H-Iron is no exception.

Sponsored jointly by Hydrocarbon Research,

**Previous attempts to directly reduce ore proved that reduction temperature is crucial . . .**

Inc., and Bethlehem Steel Co., it could prove to be one of chemical engineering's major contributions. What it does—and does efficiently—is directly reduce iron ore fines with hydrogen at relatively low temperatures and high pressures to produce metallic iron.

Its industrial potential has attracted almost every sizable steel producer in the U. S. to Hydrocarbon's Trenton, N. J., installation to see the process in action.

The technique which led to the advancement of H-Iron began as a purely chemical process linked with the needs of the petroleum industry. Developed by Texaco and Hydrocarbon Research, the basic system is known as the Partial Oxidation Process. It produces hydrogen cheaply and in large quantities. Most important, its versatility

is such that it can derive hydrogen from crude oil, natural gas, and other common fuels.

A cheap and versatile process for making hydrogen is the link which led ultimately to H-Iron. By economically providing metallic iron from fines, it may offer the steel industry a valuable lift toward expanding its capacity. It is also conceivable that the widespread adoption of the process could have a marked effect on the current scrap situation.

There are some things the H-Iron process *can't* and *won't* do, despite rumors to the contrary. It isn't likely to replace the blast furnace overnight or in the foreseeable future. Depending upon the availability of suitable ores, there are many blast furnaces it may never replace. And—as for ore suitability—there are a number of usable ores that H-Iron cannot process satisfactorily. This is not so much a limitation of the process as it is a simple fact of chemistry.

From the chemical standpoint, H-Iron does a single job and does it well. It reduces iron ore by removing *oxygen*. What remains after reduction is metallic iron and a residue of "inerts."

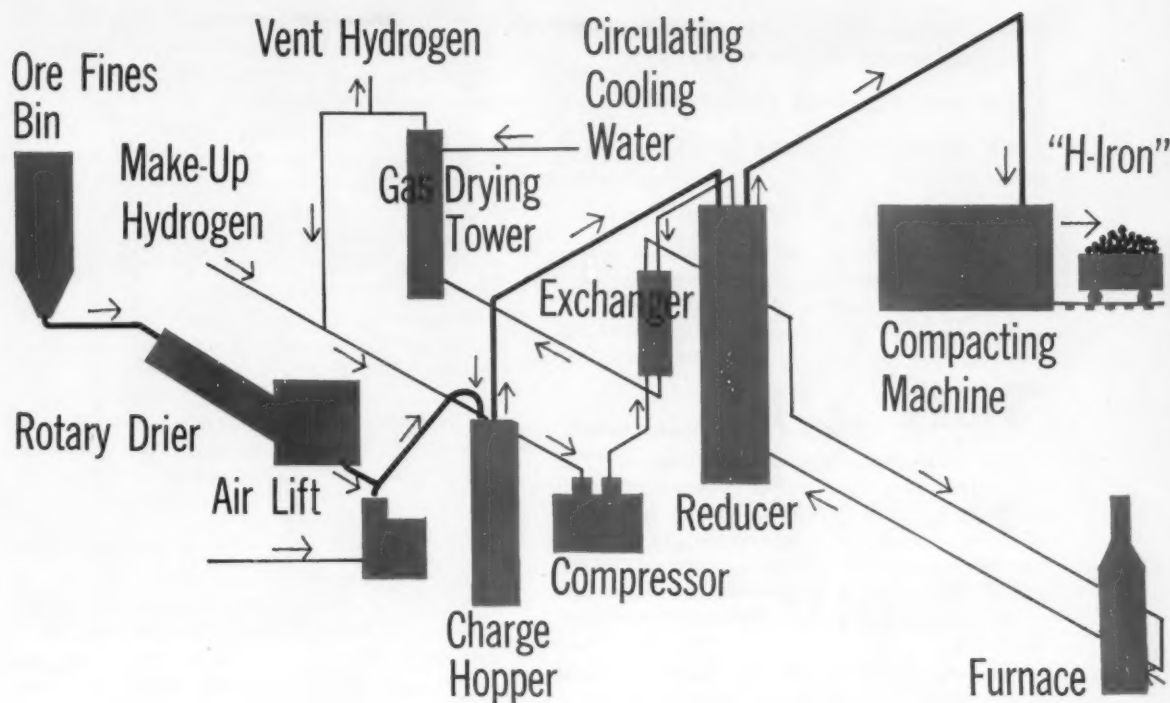
The "inerts" are so called because they are not affected chemically by the reduction process.

**TABLE 1**

**Basic Open Hearth Heats (130 Tons) Made Using "H-IRON" a Substitute for Ore and Scrap Charge**

Charging Detail		Normal Heat	37E494	38E678	43G392	45G115	38G132
Stone		12,000 lbs.	12,200 lbs.	11,700 lbs.	10,400 lbs.	12,000 lbs.	12,300 lbs.
Per Cent of Metallic Charge	Ore	7.0		1.8			
	Scrap	38.0	23.7		29.7	28.0	19.5
	Hot Metal	55.0	55.9	57.3	54.3	55.4	57.0
	"H-IRON"		20.4	40.9	16.0	16.6	23.5
Percentage Reduction of Sponge			75%	82% (oiled)	Approx. 63%	Approx. 63%	75%
Duggies		18	13	8	12	12½	16
Time (Cold)		1:30	0:55	0:50	0:50	0:40	0:55
Time to Hot Metal		2:30	1:25	1:33	2:30	2:25	2:50
Melting & Working		Normal Heat	37E494	38E678	43G392	45G115	38G132
Flush Time & Amount		0:45—¾ Pot	0:35—¼ Pot	No Flush	0:20—¼ Pot	0:35—Full Pot	1:00—¾ Pot
Time to Lime Boil		4:30	4:25	4:00	3:35	3:45	4:20
Duration of Boil		2:30	1:30	2:55	2:25	1:45	1:30
Time to Melt		7:00	5:55	6:55	6:00	5:30	5:50
Melt Carbon, per cent		0.55	0.45	over 1.20	0.10	0.42	0.30
Furnace Additions:							
Lime			1,200 lbs.	7,200 lbs.	4,800 lbs.		
Ore		4,900 lbs.	5,500 lbs.	17,500 lbs.	4,500 lbs.	1,000 lbs.	4,000 lbs.
Scrap		60 lbs.				200 lbs.	
Hot Metal					22,100 lbs.		19,100 and 4,300 lbs.
Tap Temperature, °F.		2850	2960	2800	2860	2850	2960
Tap Carbon, per cent		0.16	0.18	0.13	0.15	0.17	0.085
Charge to Tap Time		8 to 9:30	7:04	10:15	7:20	6:20	7:30
Yield %		67.8	90.0	91.4	87.2	85.6	87.7
Heats on Roof			118	124	89	90	7
Type Heat			Structural	Structural	Structural	Structural	Structural





"Inerts" include such elements as manganese and silicon. When an ore contains too high a percentage of "inerts"—as do many low grade ores—it is basically unsuitable for H-Iron processing.

These limitations are significant, but they don't put the brakes on the show. There are still plenty of suitable ores available in the U. S., Canada, South America, and Europe. And it is these ores that will help pace H-Iron's future progress.

Another determining factor must be fuel, the source of both heat and hydrogen. Wherever natural gas is cheap and plentiful, the chances

of its being used in the H-Iron process are just that much brighter. From the standpoint of cost and availability, the same principle is likely to apply to crude oils, pitch, and a variety of other common fuels.

A number of U. S. steel producers have ready access to large amounts of Venezuelan ore. Much of this ore passes the H-Iron suitability test in that it contains little more than 3 or 4 pct "inerts" by weight. Assuming that the ore size is right and that a cheap source of natural gas is available, let's check the steps that would be followed in putting the H-Iron process to work.

TABLE 2

Summary of Electric Arc Furnace Heats (Double Slag)  
Made Using 93% Reduced "H-IRON" As Substitute for  
Part of Scrap Charge

Heat No.	Grade	Size of Heat tons	Metallic Charge		Per Cent Coke Charge	Melt Carbon	Charge to Tap Time	Per Cent Yield	Remarks
			Per Cent "H-IRON"	Per Cent Scrap					
21G055	52-100	35	50.8*	49.2	1.5	2.04	10:30	88.8	
21C116	4340-AQ	35	32.3	67.7	1.25	0.65	7:20	94.2	
22G172	52-100	65	34.7*	65.3	1.0	1.50	10:55	94.6	
21G300	1025	35	20.5	79.5	1.0	0.53	5:35	96.3	Good Heat, Melt OK
23G337	1025	65	21.6	78.4	0.78	0.39	9:00	95.0	Good Heat, Melt OK
23G368	1025	65	18	82	0.7	0.48	7:20	94.5	Good Heat

\* Oiled

## Significance of the new process can best be measured on an individualized basis . . .

The iron ore fines (-20 to -325 mesh is considered most desirable) are first fed to a rotary ore dryer which serves a dual purpose. It removes almost all moisture and, at the same time, preheats the ore to a suitable reduction temperature.

### Transfer ores pneumatically

This reduction temperature—about 900°F—is a vitally important detail. Previous attempts at direct iron ore reduction made the mistake of going too high in temperature. As a result, the reduced iron became “tacky” and lost mobility. In this condition, it jammed the processing lines and rang down the curtain on commercial feasibility.

Properly preheated, the fines are transferred to a vertical charge hopper. This transfer is accomplished pneumatically, not mechanically. With the ore temperature just below 900°F, hydrogen is introduced under pressure. When the charge hopper is full, it is pressured to a level that is slightly higher than that in the reduction vessel—the next step in the line.

With the charging entrance closed, the exit valve of the charge hopper is opened. The higher pressure of the hopper causes the ore to flow, very much like water, into the reducer vessel.

### Use low gas velocities

This pneumatic type of solid transfer is what chemical engineers call “dense phase transport.” It’s a lot different from “dilute phase transport” in that it makes use of low gas velocities and greatly reduces pipe erosion. In terms of plant maintenance, this is a mighty important feature.

The heart of the process lies in the reducer vessel. It is here that the circulating hydrogen gas combines with the oxygen present in the iron ore.

And—in line with the text-book rules—the combined hydrogen and oxygen form water which, because of the heat in the vessel, takes the vapor phase. What is left is metallic iron and a small percentage of impurities which do not react with hydrogen.

To remove the water vapor from unreacted hydrogen, the stream of mixed (vapor plus H<sub>2</sub>) gases leaving the reducer vessel is cooled to about 100°F. This temperature drop, accomplished by direct heat exchange and contact with circulating cooling water, pulls the water from the gas mix.

Make-up hydrogen is added, and a circulating compressor returns dried hydrogen to the reducer. Back in the reducer the hydrogen is again ready to produce more iron.

Reduced at high pressures and at a temperature of about 900°F, the metallic iron takes the form of a rather fine powder. As such, it is of little value as a potential addition to the open hearth or electric furnace. For this reason, compacting the iron powder into a usable form is the next important step.

Eventually, the iron powder—while still hot—is fed to a pair of revolving rolls that compress the fine particles into a rather dense plate. The plate, closely resembling a powdered metal product, is broken into small chips by a set of break-up rolls. All that remains is a matter of storage and possibly an oiling of the chips to prevent rust.

### Process kept simple

As is frequently the case with an ingenious process, it is basically as simple as it is ingenious. So, too, is the process for producing low-cost hydrogen.

But, aside from its inherent merit, what does it mean to the metalworking industry?

The significance of the H-Iron process—and most of its potential impact—can best be measured on an individualized, rather than an overall, basis. To the steelmaker whose scrap picture has been keeping him awake nights, the meanings are very real and pleasantly consoling. This is particularly true of the steelmaker who is “ore rich” and “scrap poor” and can tap a source of natural gas or other fuel profitably.

Such a condition is obviously not universal. It is bound to apply to some, but it is just as likely *not* to apply to others.

In those steel mills that can use it, H-Iron may also provide new cost reduction possibilities. Among other claims, it promises to reduce furnace charging time appreciably. And with a reduction in charging time, fuel expenditures are likely to topple.

Market-wise, the H-Iron process in anything resembling full swing, would drastically color the ore import picture. It would help a number of foreign economies to establish a more favorable import-export balance.

However it goes in the months to come, chalk up the H-Iron process as a valuable new technique. In line with the recent trend, it proves that the metals industry is still a branch of chemical engineering. And—quite obviously—vice versa.

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**FURNACE OPERATOR** is guided by picture on monitor as he uses remote controls to push hot slab.

Control processing—

## Operators Look Into Hot Furnace —Via TV

♦ **WATCHFUL** "eyes" peer into a glowing reheating furnace held at 2000°F. That's exactly what's happening at Weirton Steel Co., Weirton, W. Va. But the "eyes" are those of a closed-circuit television camera which enable an operator to control processing within the furnace remotely.

Operational speedup is accomplished by strategically locating a camera encased in a metal box with a conditioned air system. This peers inside the furnace for a view of the hearth and discharge chute. Operators stand 150 ft away.

### **Eliminates cold edges**

A second TV installation provides observation and control of steel slabs in transit from the roughing to finishing departments. This vantage point is some 350 ft from the slabs.

One major advantage to the setup, supplied by the Radio Corporation of America, is elimination of cold edges in slabs overhanging the hearth.

Essentially the video setup operates as follows: (1) Three cameras, each positioned at the side of a reheating furnace in the Weirton hot mill, are connected by closed-circuit to a monitor in a remote control booth 150 ft away and around a corner. (2) A fourth camera is mounted so that it scans a 350 ft roller table

between the roughers and the finishing mills. The camera enables operators in the control booths of both to view and make certain slabs are properly positioned while in transit.

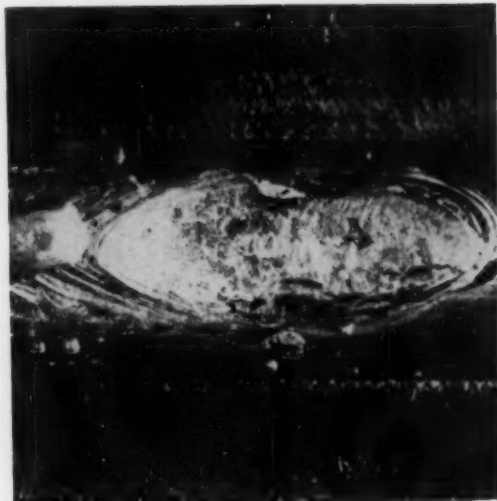
In the reheating application, cameras are located a few feet from the exit. Each camera looks through a small hole in the furnace and scans the hearth at the point where it meets the discharge chute.

When a new slab is ready for a given furnace, operator opens entry door via remote control. Automatically, the camera at the exit end of that furnace is activated and its pictures are switched on the operator's monitor. Watching the monitor, he pushes the heated slab at the exit end into the discharge chute, and moves the others forward to make room for the incoming slab. Guided by his TV picture, he positions the new exit slab so that it is at hearth's edge, but still in the uniform heating area.

"Before installation of the television system," says Ralph A. Teare, RCA Industrial Products Manager, "the operator relied on a co-worker to signal when the new exit slab reached the edge of the hearth. On occasion, as a result of the time lapse between signal and stoppage, a slab would move beyond the hearth, with a section outside the uniform heating area. Such slabs will not roll properly in the mill because of these cold edges or sections."



**FULL RESTRAINT** at backup ring causes weld cracks at junction in 1-in. type 347 plate.



**WELD CRACKS** in crater of type 347 stainless, presumably due to technique in arc breaking.

**Improve weld quality—**

## How To Avoid Cracks In

◆ Type 347 is normally considered one of the more weldable grades of stainless steel . . . But some fabricators have their troubles with cracking, both in weld deposits and adjacent heat affected zones . . . In critical applications, and many less than critical, such defects are intolerable.

◆ Here's one explanation of why zone cracking occurs . . . Some practical shop tips will help better odds against cracks in welding columbium-stabilized stainless . . . Solution is incomplete thus far, but should encourage greater use of type 347 in stainless welding jobs.

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By **W. L. FLEISCHMANN**,  
Knolls Atomic Power Laboratory,  
General Electric Co.,  
Schenectady, N. Y.

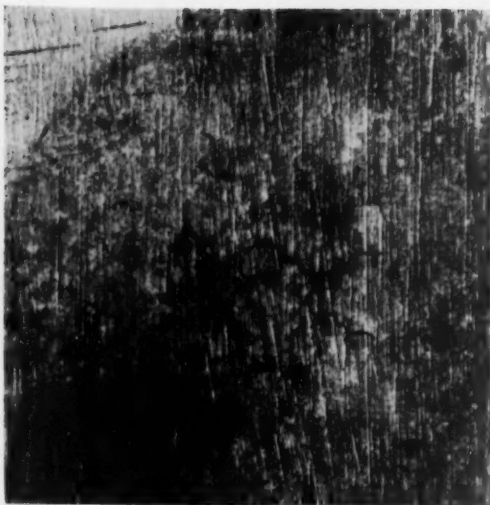
◆ TYPE 347 stainless steel is readily weldable, but like many weldable materials, it presents certain difficulties. These show up in two ways. One trouble spot is associated with fissuring of the deposit; the other, a more recently recognized problem, concerns cracking in the heat-affected zone.

There's no reason to strike type 347 from your list of weldable materials. Major reasons for choice of this alloy over others in the 300-series still exist: (1) higher creep and rupture strength, and (2) comparable freedom from sensitization in heat treatment and welding, thus minimizing corrosion in an electrolyte. Both high-temperature properties and freedom from carbide precipitation, obtained through the columbium addition, generally will outweigh the importance of weld cracking.

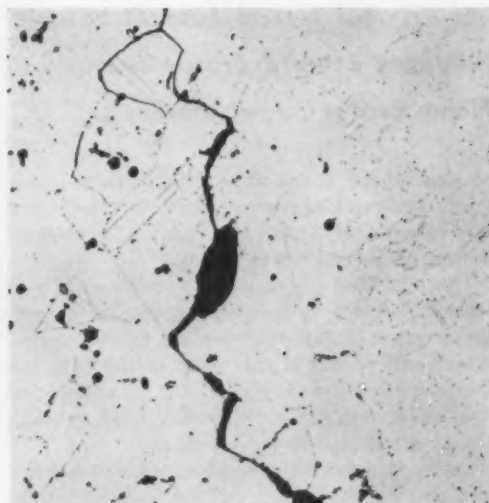
Fabricators can ease cracking at weld deposits by (1) using proper techniques in depositing the weld metal and in breaking the arc, and (2) choosing an electrode composition with a ferrite content. Both can help reduce weld cracking.

Second solution is not always adequate in





STAR CRACKS show in type 347 weld deposit, presumably associated with crater cracking.



SUCH EXTENSIVE zone cracking between base metal (l) and weld (r) as this normally show up only following heat treat or high temperature service.

## Welding Stabilized Stainless

itself. Electrode compositions most likely to reduce weld cracking can also unfavorably alter properties of the stainless alloy. As is so often the case, you'll have to balance service requirements against chances of running into weld cracking.

Welding stainless steels of the austenitic type generally relies on laying down a slightly ferritic weld deposit. Controlling ferrite content isn't easy. Measuring ferrite content in the metallurgical laboratory is no less difficult.

### Tested magnetically

Metallographic examination consumes much time. The extremely fine dendritic structure of the ferritic deposit calls for high magnification. Then too, the deposit most often is nonuniform, a result of successive weld passes and their thermal effects.

Magnetic tests can determine ferrite content, and were used here. Once technicians overcame initial problems, comparable figures resulted. Tests generally revealed that at magnetic saturation, magnetic induction bore a direct and straight line relation to ferrite

content as determined by metallographic means.

Slight change in composition of type 347 can make the alloy fully austenitic or partially ferritic. Shift from a fully austenitic to a partially ferritic weld deposit decidedly affects its microstructure.

In the austenitic phase, impurities or segregates tend to become stringers, potential focal points for any stresses subsequently introduced. In the partially ferritic alloy, delta iron lakes seem to absorb these constituents.

Difference in the microstructure between fully austenitic and partially ferritic chromium-nickel weld deposits apparently reflects differences in partition of elements. This difference in turn affects hot strength or hot ductility of the weld joints.

Thus weld metal defects in fully austenitic welds resemble those caused by segregation. Cracks seem to follow those stringer-like segregates.

Welding in reality is a casting process, and depends for its success on progressive solidification. Any restraint inhibiting plastic follow-

**"... Higher ferrite content eases  
tendency toward crater cracks ...  
Filling crater ... also helps."**

up influences crack formation. Welds made under restraint are more likely to crack. For this reason, one finds cracks at the junction of backup rings and welds.

The so-called crater crack typifies the weld cracking defect in columbium-bearing austenitic steel weld deposits. As the name implies, it normally occurs at that point of the weld run where the arc is withdrawn. Crater cracks fall into the intergranular category, and as such can be attributed to hot shortness.

Increasing ferrite content mitigates tendency toward crater cracks. Filling up the crater prior to breaking of the arc also helps.

Operators can achieve this last by a slight reversal of arc travel immediately before lifting the electrode. The star crack, assumed to be the growth of a partially removed crater crack, also responds favorably to this treatment.

Bend or tensile tests on all-weld metal specimens will detect weld deposits of an incorrectly balanced alloy. Strained or deformed material will exhibit a multitude of small fissures.

Minimum ferrite content that will enable crack-free weld deposits is difficult to define. A fully austenitic base metal tends to dilute ferrite content deposited in fusion passes. Such a material requires a welding electrode with a high chromium content, relative to the austenitic forming elements nickel and carbon.

The question naturally occurs, "Why not boost ferritic content substantially, and completely eliminate cracking?" Such action does tend to banish the problem, but unfortunately introduces another.

Service requirements of the stainless part can demand minimum ferritic content. Where ability to withstand exposure to elevate temperatures enters, low ferritic content is needed. Low magnetic permeability, also required at times, similarly prohibits excessive ferritic content.

Experience to date indicates the minimum ferrite content compatible with crack-free welds results from a chromium-nickel ratio of 1.9 to 1 in the joint. For electrodes depositing a weld with 5 pct or more ferrite, this single relationship appears sufficient. Where high temperature long-time exposure or other service needs call for lower ferrite content, another relationship must be observed: silicon to carbon ratio.

Possibly more disturbing than weld fissuring is the cracking found in the weld heat affected zone. This is the other area of concern to the welding metallurgist. Recent work by Puzako, Applett, Pellini and Heuschkel help point the way toward solving this problem.

Looking back, it now appears most metalworkers underestimated the difficulties in fabricating thick sections of type 347. This perhaps occurred because of unfamiliarity with the cracking problem. Surely today, it's agreed the columbium addition (beneficial for reasons other than welding) causes welding difficulties and associated troubles.

Knowledge presented here of the phenomena behind difficulties in welding type 347 stainless may apply widely to the field of welding alloys with fusible segregates.

Mechanism causing zone cracking seems clearly associated with grain boundary melting. On heating to welding temperature, changes in the microstructure of type 347 show up first in dissolving of dot carbides into the alloy matrix. This starts near 2400°F. Grain growth also occurs, tending to increase sensitivity to cracking of the local heat-affected area.

At 2475°F, melting of the grain boundary

---

## **Hints To Improve Welds**

- **Break weld arc properly**
  - **Avoid cratering**
  - **Select weld electrode correctly**
  - **Increase ferrite content of weld deposit if possible**
- 

sets in. Initiation of this melting action apparently does not take place simultaneously, as expected of pure metals. Rather it progresses in fits and starts, first in one discrete zone, then in another.

Explanation of this assumes presence of several phases within the columbium-bearing alloy. Each can have a different melting point.

As the welding rod passes on, the reverse effect occurs. The heat-affected zone stresses in tension as a result of cooling. Subsequent contraction of material adjacent to the fusion line produces a heat-affected zone crack.

In essence, high melting point films surrounding grains solidify prior to the change from compression to tension, and do not contribute to cracking. Lower melting point segregates solidify later, after tension sets in. Stresses result in a separation of the liquid film region from adjacent metal.

Tendency of welds to crack varies somewhat from one heat of type 347 to another. This possibly results from slight changes in composition of alloy segregates in different melts.

Exactly what these segregates are, and how to control them in alloying, remains to be found. To mill metallurgists falls the task of developing type 347 stainless so balanced that no low melting point phases exist.

♦ MOST plant people would consider tolerances of millionths of an inch impractical, or even impossible, in day-to-day production. But that's not the case at Timken Roller Bearing Co., Canton, Ohio, where making of ultra-precision parts is a routine business. Tapered roller bearings, for instance, are turned out in commercial quantities to 0.000075-in. accuracy requirements.

These requirements can't be any better than the machine tools and gages producing them.

Timken has put hundreds of thousands of dollars into master gages. To improve these still further, some sort of super special grinding machine seemed in order.

Accordingly, Timken engineers put their heads together with the machine tool people. Result was the precision grinding machines shown, capable of grinding to 0.000010-in.

They're paying substantial benefits. Chief among these, of course, is Timken's ability to boost accuracy and quality of their products. Increased grinding accuracy means even better gages—and life of gages is much greater, so fewer are required. At the same time, the tool room is no longer constantly tied up making new gages to replace the short-lived older ones. This had often been a production bottleneck.

The grinder has an exceptionally sturdy base. Wheel-head slide on the ID grinder is force-lubricated. All moving parts of the ID wheel head must be carefully machined and all fits must be metal-to-metal with no press, yet no looseness. Work head spindle on the ID grinder is further checked by sweeping the face of the chuck with an indicator.

#### Minute adjustments possible

Work head pivots on the face of the chuck make a finer adjustment of the straight and taper alignment possible. Face of the magnetic chuck and work placed on the chuck must be absolutely flat. Otherwise a hole ground in the workpiece would be neither round nor straight after magnetism on the chuck was released.

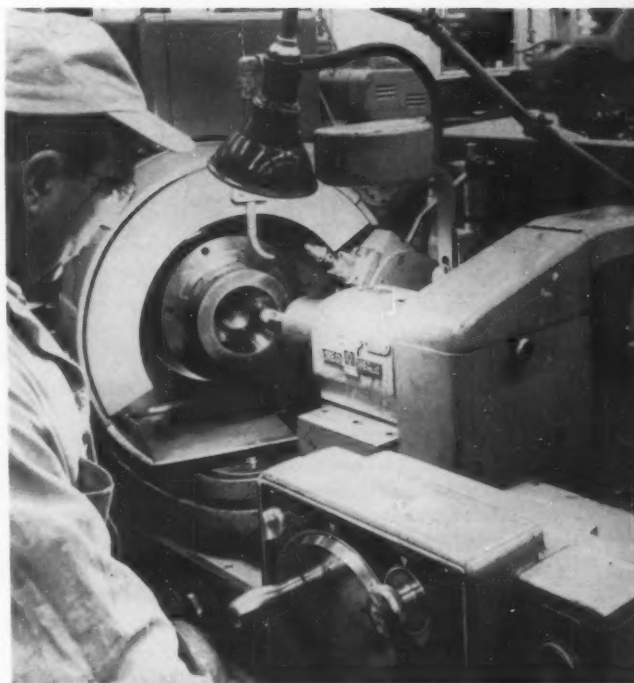
Table ways on the OD grinder are lapped and also are force-lubricated.

A carefully-balanced, variable-speed dc motor of one hp drives the wheel head on the OD grinding machine. Work head on the internal grinder is driven by a variable speed hydraulic motor; the wheel head, by an ac one hp motor.

DC motors where used, were chosen to reduce pulsating and to allow speed variation. Speed control allows adjustment, if the wheel is not grinding properly, to afford better operating conditions.

Floor of Timken's precision grinding room is a 24-to-36 in., steel-reinforced, solid concrete slab, detached from walls and girders. Temperature is held at a constant 68 to 70°F; humidity at a steady 45 pct.

## Tool Grinder Holds Tolerances To Millionths



SPECIALLY-BUILT, ultra-precise grinder in Timken's high-precision tool grinding room rests on vibration-resistant floor. Room is air-conditioned, humidity-controlled.

Many choices offered—

## Joining Stampings: Which Method is Best for You?

◆ Stampings are usually joined together or to other parts to make an assembled product . . . And there are about 15 principal joining methods for permanent bonds . . . Choice of the best one for the job at hand is important in many ways.

◆ Here's help to guide you in making the right choice . . . You'll find worthwhile tips on riveting, brazing, welding, and all the other techniques . . . Clear-cut sketches point up the text, serve as excellent visual aids.

By FEDERICO STRASSER, Consultant, Santiago, Chile

◆ INDIVIDUAL STAMPINGS are seldom used by themselves. In most cases they are joined to other stampings or to other components of an assembled product. The joining methods should be determined at an early stage of design development; they can have a decisive influence upon the design and the cost of the parts to be united.

Choice of a joining method depends on: (1) the materials to be joined, (2) type of production equipment and skills available, (3) strength required to resist in-service stresses, (4) the corrosive conditions the union might have to withstand, (5) quantity of workpieces involved, and (6) whether the joint is to be permanent, semi-permanent or temporary.

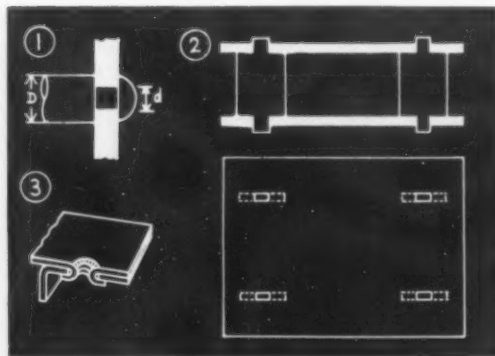
Riveting is one of the most important ways

to join sheet metal stampings. Tubular rivets, which have a hole in the shank end, require much less pressure to expand the end than the conventional solid type. They are preferred for joining sheet metal parts to non-metallic materials such as plastic, fiber or cardboard.

Hollow rivets made from tubing, or by a properly formed embossed hole in the stamping itself, are used successfully where joint-strength requirements are low. As with an eyelet, ends are flared or curled.

For certain fastening operations, a rivet shank may be formed by turning a small shaft on the end of a round workpiece, Fig. 1. If the appearance of the rivet head is immaterial, it may be formed simply by flattening the end. Best strength condition in this type of riveted joint demands at least that  $D:d=3:2$ .

Contoured rivets are effective in many cases. Here, stampings are trimmed in such a way that ears or tabs are formed. These are then introduced in suitable holes punched in other pieces of sheet metal or stampings and riveted adequately, Fig. 2. For economy reasons receiving holes are usually round, even though the





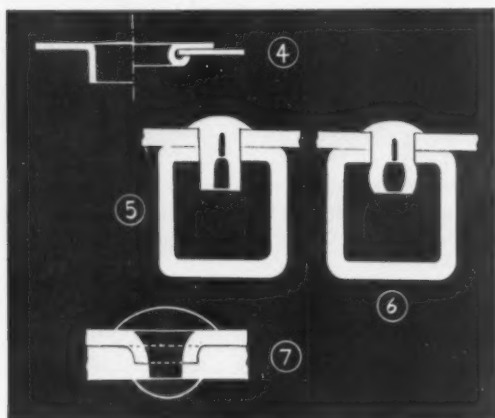
cross section of the rivet tabs may be square or rectangular.

Another successful method for riveting thin or medium-thick metal stock begins with the forming of embossed-flanged holes in one stamping component. These are inserted into corresponding holes in another component, and the union is made secure by flaring or spreading the hollow boss outward, Fig. 3. Where necessary, instead of simple flaring, the boss may actually be curled, Fig. 4.

#### Blind rivets might help

Airplane manufacturing makes wide use of blind rivets, which can only be worked on the head end. Common types have a small explosive charge at the shank end; a sharp blow on the rivet head causes the charge to explode and expand the opposite end, Figs. 5 and 6.

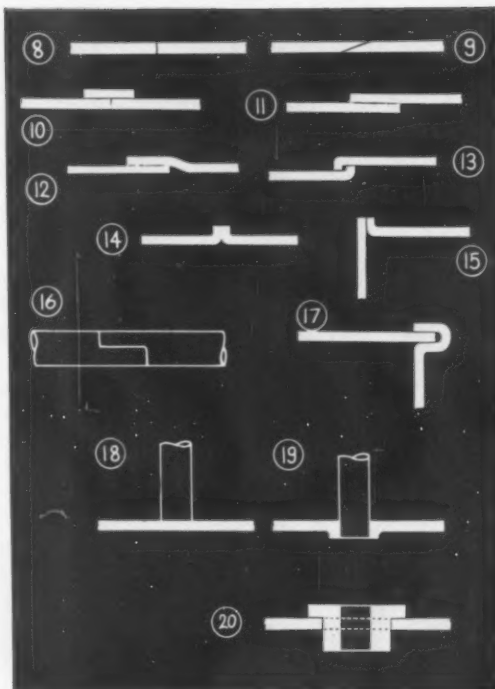
Rotary riveting is an easy and comparatively inexpensive method for working the heads of weak and delicately contoured rivets. This technique uses a toothed disc to apply progressive rather than simultaneous pressure to each head. This avoids buckling or bending of the rivet or the workpiece.



Riveted joints are not always immovable; sometimes it is desirable to have the components free to move or turn around the rivet shank. This type of loose, pivot-type riveting is done simply by putting paper spacers between the two workpieces and tearing them out when the union is made.

Where ceramic parts cannot withstand the shock of impact blows, they are often riveted to stampings by electro thermal means. Either the stamping is machined with a proper rivet shaft, or a separate rivet is used. The rivet or shaft is placed between two electrodes and heated until it can be pressed easily into proper form. As the rivet cools it contracts to create a tight joint, and the slow cooling doesn't transmit any shock or impact to the ceramic section.

Flush riveting is difficult and expensive and



should only be used where it is necessary to have flat external surfaces. Common practice is to draw, dimple or countersink one or both stampings to accept the rivet and allow space for it to be headed over. It is preferable to dimple thin sheet; such indentations are stronger than the countersunk variety. Hollow rivets are well adapted to flush riveting if the workpiece dimensions permit countersinking.

Riveting is not usually a dependable way to align two or more stampings; clearance holes do not fit rivet shanks closely enough. But if the work must be aligned in this manner, it can best be done by putting an extruded hole in one stamping and a stepped, two-diameter hole in the other, Fig. 7. The upper section will conform to the shape and dimensions of the rivet boss, and the bottom one provides a rivet-clearance hole.

Where greater precision in alignment is required, make provision for the use of dowel pins, or for forming extruded studs in one stamping which can match punched holes in the other.

The following practical hints may be helpful for correct design of parts to be riveted:

1. Where rivets and stampings are made of

#### EDITOR'S NOTE

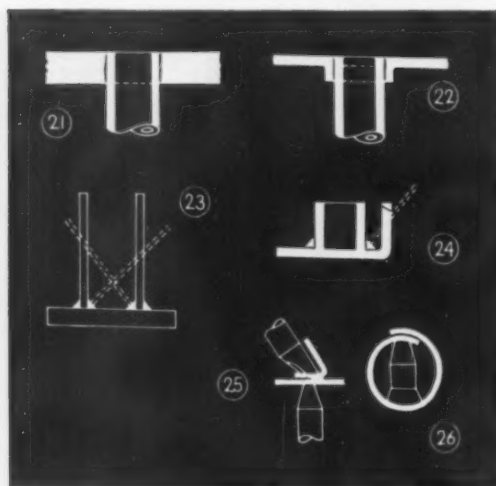
■ This is the fifth article on stampings in a current series written by Mr. Strasser for *The Iron Age*. Previous subjects and dates: (1) Blanking—March 15, 1956, p. 83; (2) Piercing—April 5, 1956, p. 108; (3) Bending—May 3, 1956, p. 100; (4) Special Bends—June 7, p. 124.

**"... Design for brazing should avoid butt or fillet joints. A scarfed union is preferable."**

the same metal, a rivet shaft whose diameter is 1.4 times the square root of the thickest stamping will provide correct rivet-shearing strength.

2. On an average, spacing between rivets should be from three to eight times the diameter of rivet shanks.

3. Rivet holes should be neither too near nor too far from the workpiece edge: for example,



not nearer the edge than 1.5 times stock thickness; and not farther from the edge than eight times stock thickness.

4. When joining stampings of different thicknesses, it is preferable to locate the rivet head on the side of the thinner workpiece. This allows the staking or upsetting of the shaft end to be done against the heavier material.

5. Where materials are too soft to withstand upsetting of the shaft end of a rivet, put steel washers between the rivet heads and the stampings.

Soldering, a widely used method for joining stampings, forms unions which are not usually subjected to severe stresses. Typical, basic designs for soldered joints are shown in Figs. 8 to 20. Majority of these designs can also be used for brazed and welded joints.

Brazed joints are stronger than the soft-soldered variety. Design for brazing should unite rather large adjoining surface areas. But avoid butt or fillet joints; at the very least, use a scarfed union, Fig. 9.

A common application of brazing is the joining of thin metal tubing to comparatively thick metal sheet (thickness ratio more than 1:4), where welding would obviously burn the thinner material, Fig. 21. Another method of brazing this type of joint is to make an embossed hole in the metal sheet or stamping, Fig. 22.

Spot welding is the most commonly used welding method for making lap joints between stampings. Size and shape of these welds (usually circular) is limited by the size and shape of the welding electrodes. For light service, spot welding is often a successful substitute for riveting, inasmuch as the stampings do not have to be punched, pierced, drilled or extruded. Moreover, spot welding can be done very rapidly.

Design of stampings to be joined by welding should take into consideration such factors as: (1) type of joint, (2) accessibility of welding equipment to the area to be joined, (3) basic dimensions of the principal components.

Figs. 23 and 24 illustrate incorrect design from the standpoint of accessibility of welding equipment. Occasionally, as in Figs. 25 and 26, specially shaped electrodes are needed because of necessary design details.

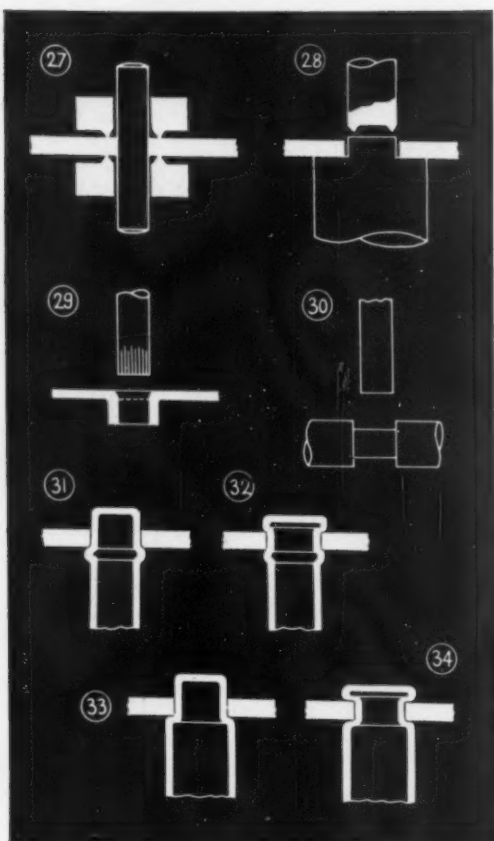
#### Staking works two ways

Staking is another useful method for locking two parts (one is usually a sheet metal component) together. It can be done either by squeezing the metal in around a hole (Fig. 27), or by spreading the shaft out, Fig. 28. In most cases the staking is done with chisel-like punch blows at only a few points on the periphery of the hole or the shaft.

Although press-fitting is not one of the more widely used joining methods, it is often used for forcing a shaft through a smaller-diameter hole. Typical examples are gears, cams, pawls, collars and other similar assemblies. To stake thin stampings, it is sometimes helpful to make an embossed hole; in addition, the shaft end can be knurled to provide more strength in the union, Fig. 29.

#### Principal Permanent-Joining Methods

Riveting	Round Curling
Soldering	Flanging
Brazing	Seaming
Welding	Crimping
Staking	Penetrating
Pressing	Stitching
Flat Curling	Embedding
Adhesive bonding	



By embossing ribs, or beads of one stamping into corresponding holes or depressions on another component, many parts will remain firmly clamped without the aid of rivets, screws or other auxiliary joining means. This is usually done by wrapping the parts with sheet metal and then pressing them together.

Flat curling is a convenient technique where the assembly, such as a hinge, must be free to turn around a shaft. In a typical case, one or more sections of the shaft will be reduced in diameter to accept the curled hinge strip and prevent it from sliding along the shaft, Fig. 30.

#### Flanging grips tubes

To put a drawn shell or length of tubing through a hole in a stamping, either of these two flanging methods may be used: (1) a circular bead is made near the end of the shell (Fig. 31) and then the free end of the tube is flattened, Fig. 32, (2) the end of the shell or tube can be reduced and then flattened after it is inserted in the hole, Figs. 33 and 34. In similar manner, the open ends of drawn shells or tubing may be fastened to stampings.

Crimping is rather widely used for fastening thin workpieces where stock thickness ranges between 0.03 in. and 0.10 in. Fig. 35 illustrates

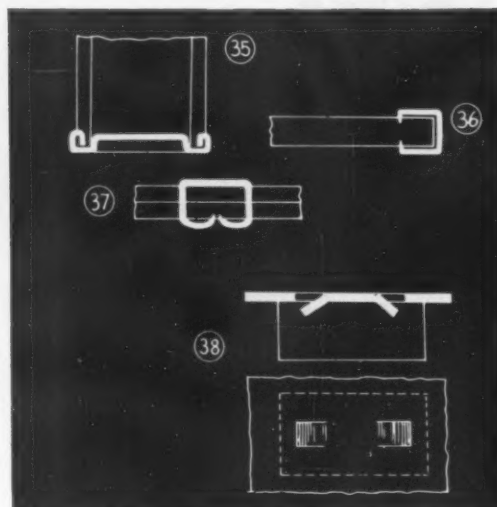
the manner in which a thin metal bottom is crimped to a cardboard box.

In the penetration method of joining, the metal stamping is made with teeth that can penetrate the other component of the union (usually a non-metallic part). By properly clinching or bending the tooth points, the joint is made secure. Typical applications include grips for leather belting and end-protection pieces for wooden strips, as shown in Fig. 36.

#### Stitch flat pieces together

Wire stitching is also used successfully to unite two or more pieces of flat material in metal-to-metal or metal-to-non-metal, contact, Fig. 37. Stitches are made with pieces of wire that are fed from a coil, cut to length, formed, driven through the solid workpieces and clinched—all by a machine designed for this purpose.

Permanent unions can also be created by an embedding process whereby a fluid or plastic



material solidifies to form a complete envelope around an insert. Fig. 38 shows how metal stampings can be anchored easily in plastic moldings.

The technique of bonding or cementing metallic surfaces or metallic and non-metallic surfaces into permanent unions has been perfected considerably in recent years. Some bonding agents are applied warm, others cold. Pressure is sometimes used to produce better unions. Judging from many successful applications of these methods, it seems evident that adhesives will come to have a more important place in the joining of metal stampings.

*Reprints: Individual copies of this article are available as long as the supply lasts. Write Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.*

Cool, cool water—

# New Pump House Slakes Steel Mill Thirst

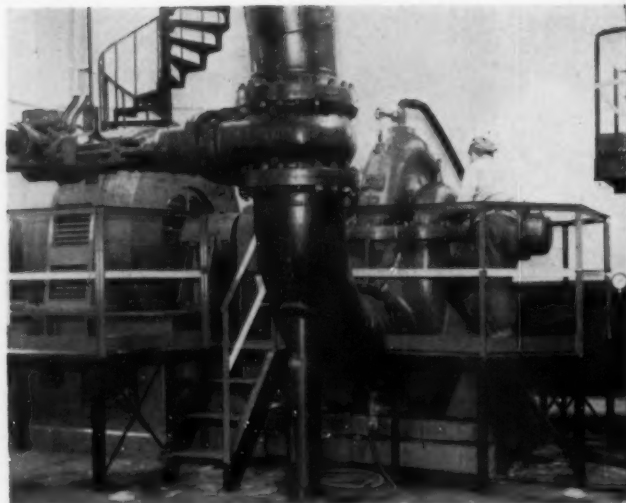
◆ It takes water, millions of gallons of it, to turn out steel ingots and mill products . . . It doesn't show up in the final specs, but it's as vital as scrap or ore . . . It's a major reason why most steel plants set up shop alongside rivers.

◆ Weirton Steel Co. completed its most recent pump-house-facilities expansion only last year . . . Today's total rated capacity is 184,000 gpm . . . Here's what was done, and how it was done.

By C. W. GRANACHER,  
Project Engineer,  
Contracting Div., Dravo Corp.,  
Pittsburgh

◆ THERE'S A REASON why steel mills are almost always sited next to rivers. They need vast, almost unbelievable quantities of water to slake their cooling and processing thirst. And as steelmakers expand in size over the years, their enormous thirst grows right along with them.

Weirton Steel Co., Weirton, W. Va., is a good example. This division of National Steel started life as a simple rolling mill, building its first pump house along the Ohio River in 1909. Today it's a major integrated mill, operating four huge blast furnaces, openhearth and associated rolling and finishing facilities. And it's kept pace water-wise. Three 3400 gpm pumps originally installed have grown into



RECENTLY INSTALLED, this big pump sucks up Ohio River water at 30,000 gpm rate, drives it through 24-in. discharge line (foreground) to help meet Weirton's higher water requirements.

today's total of seven pumps, with total rated capacity of 184,000 gpm (265-million daily).

The most recent of these expansion projects was completed only last year by the Dravo Corp.

This was a new addition to the pump house. Located on the upstream or north side of the original round pump house, this masonry building is 58½ ft long x 32 ft wide. It stretches in height from 20 ft below normal pool level to 80 ft above pool.

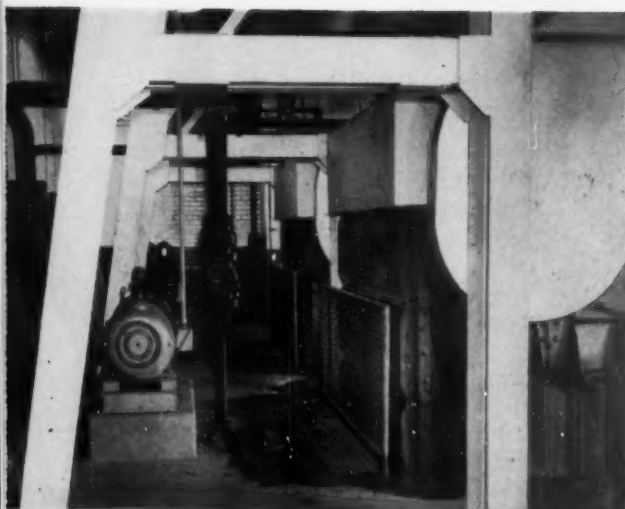
As of now, only one 30,000 gpm pump has been installed. But plenty of elbow room has been left for meeting future requirements—another 30,000 gpm pump and a 50,000 gpm unit were provided for in the design of the building, and can be installed as demand increases. The 30,000 gpm unit already in is a single-stage, horizontal unit, driven by a 2000 hp motor. It operates at 720 rpm and delivers 30,000 gpm or 43-million gallons daily at a total dynamic head of 210 ft. Thirty inch diam suction piping drags in the river from the wet wells; discharge is 24 in.

Construction posed some interesting problems. Ledge rock lies only about 12 ft below pool at the pump house site, so it seemed logical to found the new structure on rock, the same as the previous buildings had been.

But the presence of two railroad tracks, running along the top of the riverbank just behind the new structure, introduced a new element into the picture.

They meant that a cofferdam would have to be driven to rock for the construction work.





**TRAVELING SCREENS** 8-ft wide serve two of the new pump house addition's four wet wells. Other two wells are slated for similar screens, when later pumps are installed to meet growing needs.

This would hold enough of the riverbank in place so rail traffic could continue on the landward one of the two railroad tracks. Back wall and upstream end of this cofferdam were formed of Z-type steel sheet piling, with two bracing sets of steel and timber. The river side was built of three steel sheet pile cells, 29 ft in diam., filled with sand and gravel. Their massiveness was to resist the horizontal thrust of the riverbank.

Front cells were built from a floating derrick boat. With these completed, a 15-ton whirler crane was mounted on them, and from there out handled all materials used in construction of the new pump house. It also served to set and drive the back end walls of the cofferdam, to place the bracing sets, and to excavate the earth and rock to plan grade.

#### **Anchored securely**

There was a possibility of floating of the pump house at extreme high water. To resist this, 55 one-and-one-quarter in. square steel dowels were anchored in holes drilled 10 ft deep in the foundation rock. Cofferdam bracing sets were removed as the pump house walls rose in the coffer. When the structure was complete, the site was back-filled and the coffer removed.

Facilities were installed with future expansions in mind. Water entering the pump house pours into four wet wells through structural steel bar screens of 4 in. mesh.

Two of these wells now contain 8 ft wide traveling water screens with No. 12 gage screen cloth of No. 2 mesh ( $\frac{3}{8}$ -in. square openings). Additional water screens will be placed in the

other two wells when future pumps are installed. Each wet well can be unwatered when the river is at normal pool by using timber stop logs in front of the bar screens, and timber bulkheads over openings that interconnect all wells behind the traveling water screens.

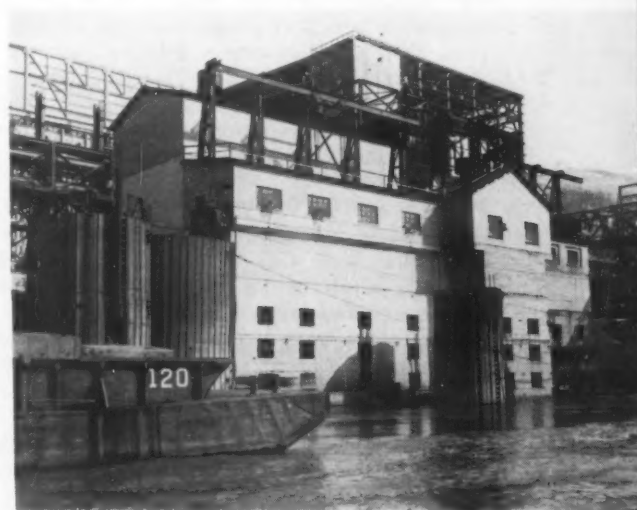
For normal repairs and maintenance, though, a pair of 10-ton chain hoists hung on a trolley beam will raise the traveling screens up clear of the water.

Though only one 30,000 gpm pump is now installed, suction lines for all three were built in through the wall separating the pump room and the wet wells. Lines for the two smaller units terminate behind the traveling screens in flared bell mouths pointed downward. Intake of the 50,000 gpm unit will be on the bottom of the pump, so its suction line is elbowed to extend out horizontally through the pump room wall into the wet well.

The big pump itself will mount on the floor of the structure so the suction line is in an open pit below floor level. This pit also serves as a drainage sump for the pump house.

A 42-in. diam header line runs along the front, north end and back walls of the pump room, about 34 ft above floor level, leaving through the back wall to connect to mill supply lines. Discharge lines from pumping units connect to this header pipe.

Like the original structure and a 1926 addition, the 1955 building is designed to withstand both flotation and hydrostatic pressure with the river at elevation 692. This is seven ft above main floor level and 10 ft higher than any previous high water recorded in the area.



**WEIRTON's** original pumping station occupied area in center of this structure. Total rated capacity of its three pumps was 10,200 gpm. Today's total capacity: 184,000 gpm.

For uniform weight, size—

## Automatic Scale Controls Baler Feed

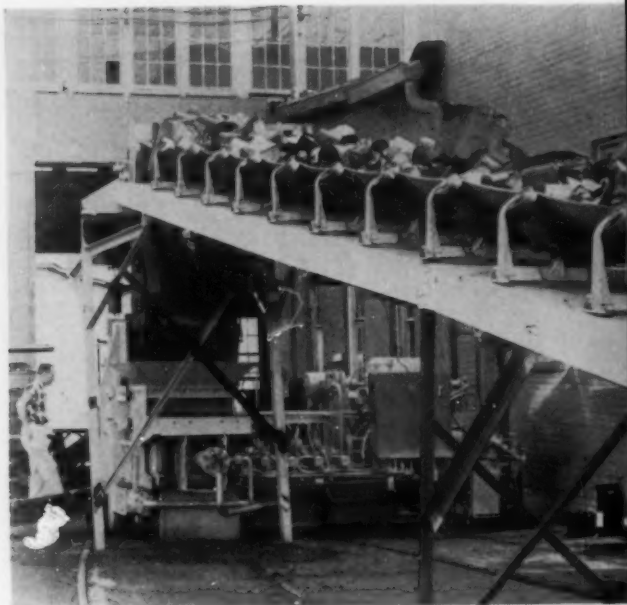
◆ **HIGH-SPEED PRODUCTION** of scrap bales of uniform weight and size is made possible through the tandem operation of a hydraulic baling press working in conjunction with an automatic scale.

The baling press, manufactured by Harris Foundry and Machine Co., Cordele, Ga., automatically receives scrap, transfers it to a press chamber where it is compressed into an 8 in. cube, then ejects it onto a delivery conveyor. It will handle a wide range of ferrous and non-ferrous scrap materials, including sheet clippings and skeleton scrap resulting from stamping, punching and trimming operations.

### **Weighed, baled continuously**

Automatic weighing equipment made by Richardson Scale Co., Clifton, N. J., is used with the scrap baling press when size and weight of the finished bale are important factors to the scrap processor. The automatic scale offers two important advantages: (1) by feeding identical loads of scrap into the baler for each baling cycle, press users obtain close control over the size and weight of the finished bale; (2) high-speed feeding of scrap to the baler is automatically controlled by the scale, which is electrically interlocked with both the press and the feed belt conveyor for a fully synchronized operation.

Entire baling sequence is controlled automatically from initial loading of scrap through



**SEGREGATED SCRAP**, loaded by bulldozer or electromagnet, feeds to weigher-baler at 60 fpm.

compressing operation to delivery of the finished bundle. After segregation, scrap feeds by bulldozer or electromagnet onto an inclined continuous belt conveyor. Belt lifts scrap at approximately 60 fpm to the automatic weigher.

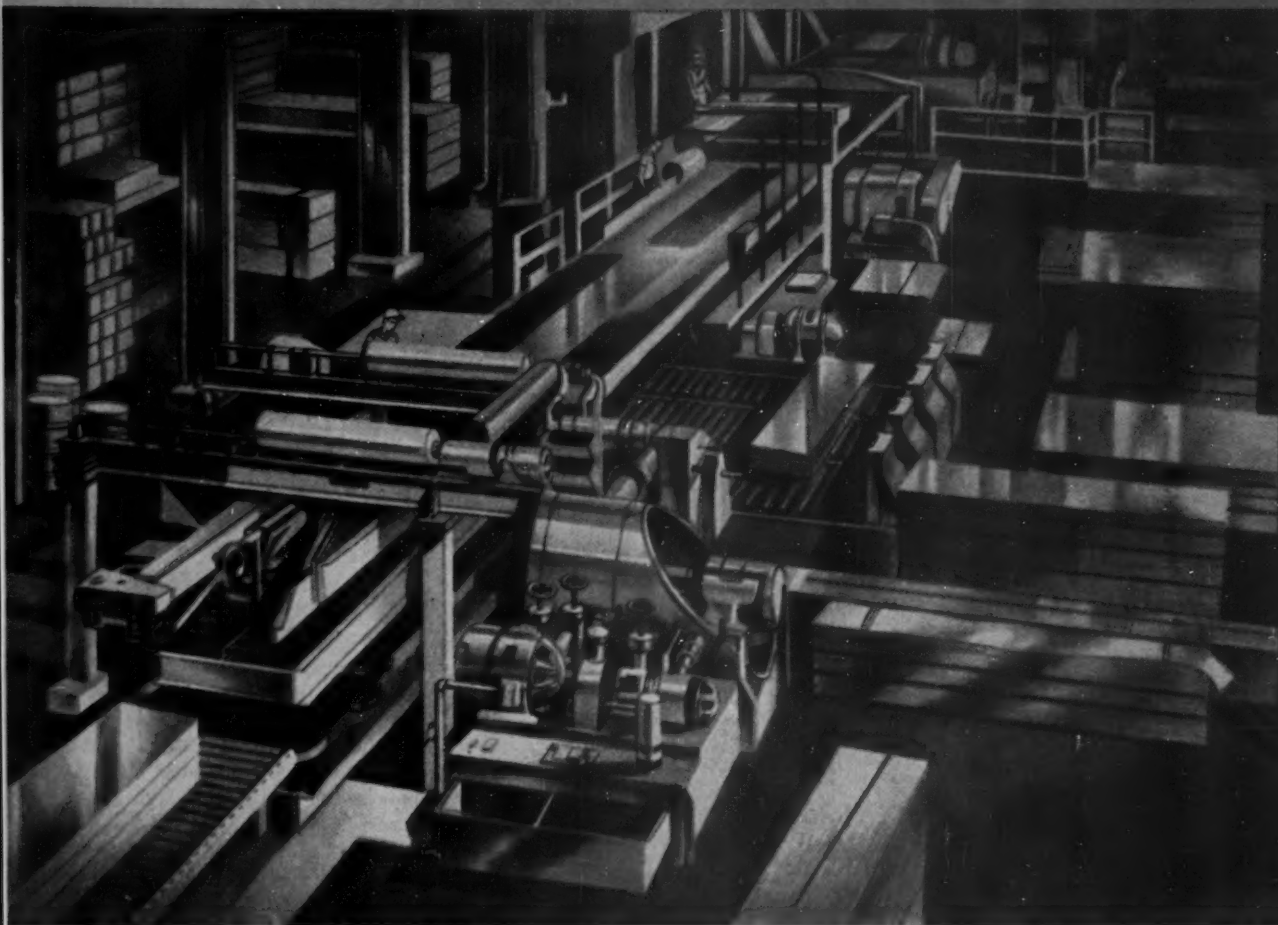
Scale adjusts for different scrap materials and different bale sizes desired. A 50-lb load is standard.

Operation of the baling press is continuous. A new load of scrap feeds into the loading chamber while another is baled in the press box. Hydraulic tramper applies 2000 psi vertically. Steel ram compresses scrap horizontally then ejects finished bale from machine. Scale, press and conveyor electrically interlock for fully synchronized operation.

Push-button control permits automatic, semi-automatic or manual press operation. Top speed runs about 120 bales an hour, representing 4000 to 6000 lb of scrap. Bale size is fixed at 8 in., sq, but length varies with quantity and weight of scrap metal. Material also enters in determining length.

Weighing hopper of the scale hangs from an overhead beam. This scale beam actuates the microswitch that stops belt feed at full load.

An integral magnetic disk brake on the conveyor motor avoids hopper overloading by its rapid clamping action. A compensating weight anticipates cutoff. This helps correct for the column of scrap falling into the hopper as full load is attained.



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## New Technical Literature:

### Catalogs and Bulletins

#### Masking tape bench rack

Leaflet gives super-capsule, though sufficient, review of masking tape bench rack. Of sturdy spot-welded wire with sheet metal ends, electroplated, it is 3½ in. high, 6½ in. wide and 13 in. long. It weighs only a pound and it keeps rolls from being carelessly scattered over the masking bench. Though seemingly insignificant at first glance, the value of such a rack is realized when one thinks of time and money wasted by damaged edges and lost rolls. It is well worth looking into for anyone making extensive use of masking tape. *By-Buk Co.*

For free copy circle No. 1 on postcard, p. 93

#### Oil, water, air valves

Solenoid operated, pilot controlled valves for air, water and oil from zero to 500 psi are contained in a new eight-page catalog. Standard two position, explosion proof and J.I.C. type valves are illustrated with specifications and ordering information. Also included are external pilot, explosion proof external pilot, auxiliary manual controls, and more. Dimensions and photographs of all major models, along with engineering drawings, are given. *Barksdale Valves.*

For free copy circle No. 2 on postcard, p. 93

#### Furnace strip

Dozen page folder crammed with tables and charts gives complete picture of new resistance wire, ribbon and furnace strip. Tables are given on resistivity, density and for furnace strip, resistance is explained in ohms per ft and pounds per ft. Illustrations and text round out a review of what is described as a time proven, low nickel heating element alloy for controlled atmosphere furnace applications operating at temperatures up to 1806° F. *Hoskins Mfg. Co.*

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#### FOR YOUR COPY

**Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 93.**

#### Foundry information

Illustrated, pocket-size booklet called "Useful Information for Foundrymen" provides practical data pertaining to various foundry operations. Information concerning cupolas, electric furnaces and transformers, fuels, ladles, melting points, temperatures, weights and other foundry operations is included. Reference tables are convenient to explanatory material. Space has been provided for working notes near these tables. And for convenience an index has been included. *Whiting Corp.*

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#### Metals preparation

Four page, two color advertising sheet gives information on use of company's "Pre-Fos" used in preparing metals for painting. Run-down on main features (i.e.: cleans and phosphates in one operation), physical properties, and benefits is given. *Wyandotte Chemicals Corp.*

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#### Engineering catalog

Covering the complete line of company's mechanical power transmission products, a new engineering catalog is just off the press. It contains 328 pages including sectional drawings, dimensions, weights, prices, application details and engineering tables. Eight pages are devoted to a detailed index. *Dodge Mfg. Corp.*

For free copy circle No. 6 on postcard, p. 93



### Magnetic loop control

Two-page bulletin on magnetic loop control for steel mill pickling lines describes operation of magnetic loop control and offers comments from customers. It also includes a typical list of equipment required for magnetic loop control. Among advantages cited in the bulletin are: reduced mechanical maintenance, high-speed operation of line, maintenance of production continuity, constant loop position regardless of strip speed, fast response, continuous indication of loop position, acid-proof, and non-corrosive pickup unit, elimination of dancer rolls, and simplicity of operation. *General Electric Co.*

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### Aluminum chart

Illustrated flow chart outlining production of aluminum, from mining of the ore through reduction to the metal, has been prepared by a major aluminum producer. The 15 x 21 in. chart, printed in color, will be mailed folded. Same chart is available on heavy paperboard for wall mounting. Material covers mining of bauxite, extraction of alumina, and the various steps necessary in conversion to aluminum. *Reynolds Metals Co.*

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### Painting operations

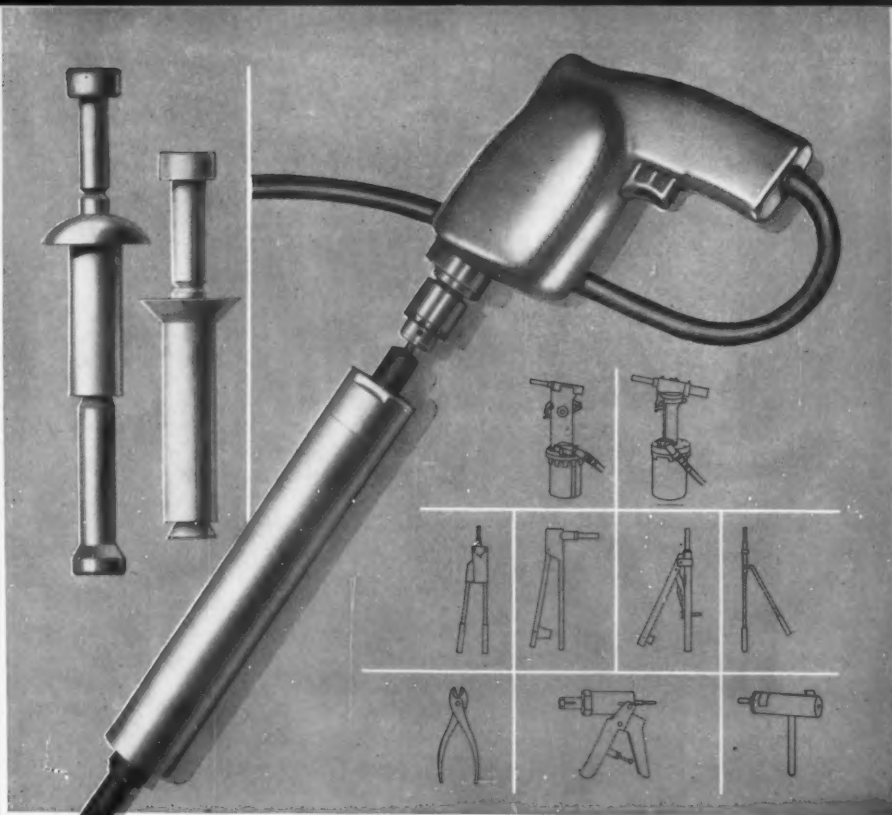
Six basic advantages of using a certain paint spray system are reviewed in an eight page booklet. These are listed as: better finishes, material savings, faster application, easier spraying, reduced maintenance and overload, and a more uniform coating. *DeVilbiss Co.*

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### "Opportunity Unlimited"

This new booklet "Opportunities Unlimited" covers a number of the numerous applications where integrally finned tube is used and can be used effectively and economically. It includes applications in such industries as processing, electrical, water heater, refrigeration and allied industries. *Wolverine Tube, Div. of Calumet & Helica, Inc.*

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## Now You Can Set Blind Rivets With This New Townsend Drill Attachment!

The versatility, positive action, ease of handling and maintenance-free service you get with this new Townsend drill attachment for setting blind rivets brings increased efficiency to your production lines. Its use will help cut unit costs and reduce equipment inventory.

The new G-80 drill attachment is designed for use with either an electric or pneumatic powered drill which provides new flexibility of operation. It is now possible for any fabricator to set all lengths and diameters of aluminum, steel and monel Cherry rivets and Townsend blind rivets with only one tool.

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rivets can be used in many fabricating operations. These include application of roofing and siding material in building construction—the assembly of components of air conditioning equipment, home appliances, electronic equipment, awnings, jalousies, screens, storm doors, signs and windows.

You will see how one man can install this tamper-proof, vibration-resistant blind rivet in a split second. Townsend blind rivets provide high clinch and a strong fastening method for many applications that otherwise would be slow and expensive. For information on the G-80 gun and blind rivets, write Townsend Company, P.O. Box 237B, New Brighton, Pa.

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## FREE TECHNICAL LITERATURE

### Holding tools

Manufacturer of multiple drill spindles and production holding tools, has just published a two-color, six-page circular illustrating and describing several tools from their line such as slip spindle assemblies, drill and tap drivers, spindle extension assemblies, adapters, and turret tool holders. Also included is new tension or compression adjustable tap driver which features a trepan clamp that speeds tap changes and makes close-center work easier. *Seibert & Sons, Inc.*

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### Fluid drives

Covering application of fluid drives in the petroleum industry, a four page, 4-color illustrated bulletin describes adjustable speed units and outlines their advantages as applied to drilling rigs, pipe-line compressor stations, refineries and other petroleum industry applications. A cross-section drawing, which includes a flow diagram, illustrates the operation of the new unit. *American Blower Corp.*

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### Valve stem packing

Custom-made valve stem packings are covered in a new bulletin. It describes two general types in which they are available (braided of asbestos yarns, and plastic), the manner in which they are made and illustrates the shapes most commonly used. It lists size limitations. *Packing Div., Raybestos-Manhattan, Inc.*

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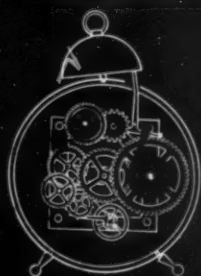
### Rotary transfer machines

New 24 page catalog gives load ratings and dimensions of more than 150 standard high speed "Intermittor" index tables with many in stock for immediate delivery. The line, including dial sizes ranging from 12 to 120 in. with from 4 to 36 stations, features extreme precision without auxiliary locking methods, production speeds up to 30,000 pieces an hr and 8000 hr operation without maintenance. *Ferguson Machine & Tool Co.*

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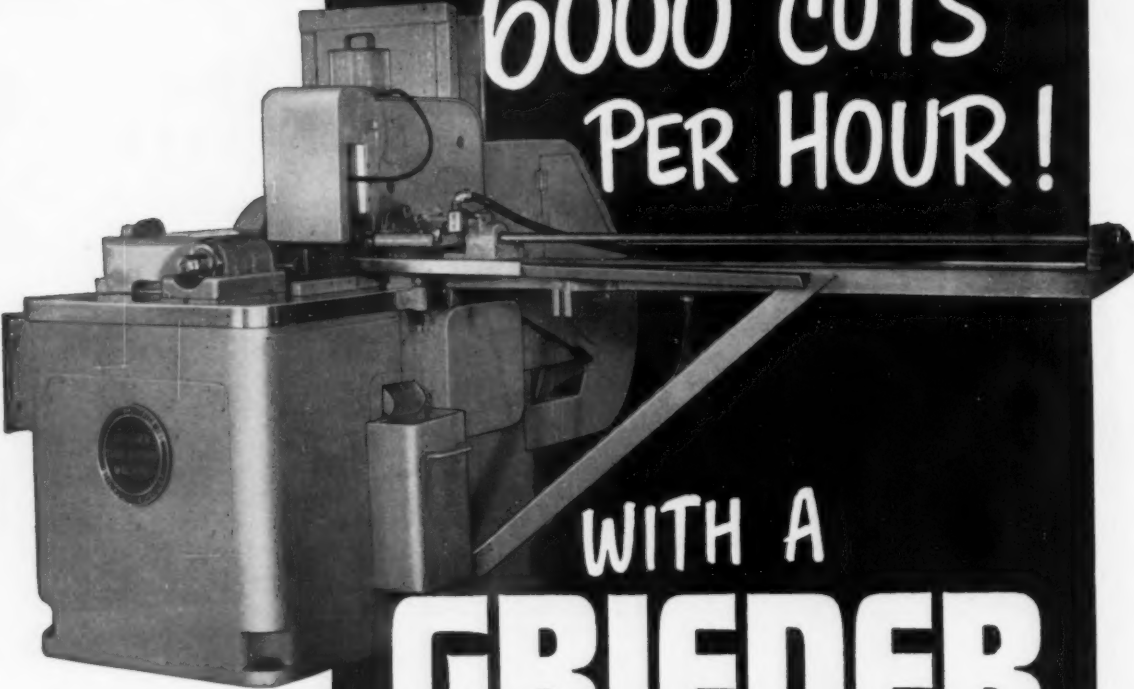
are used for Textile Machine Parts such as sinkers, needles, etc. • Band Saws (metal, wood and butcher) • Camera Shutters • Clock and Watch Springs • Compressor Valves • Doctor Blades • Feeler Gauges • Knives such as cigarette knives, surgical, etc. • Razor Blades • Shock Absorbers • A Wide Variety of Springs • Trowels • Reeds: Vibrator, Textile, etc., • Piston Ring Segment and Expanders • and many other applications.

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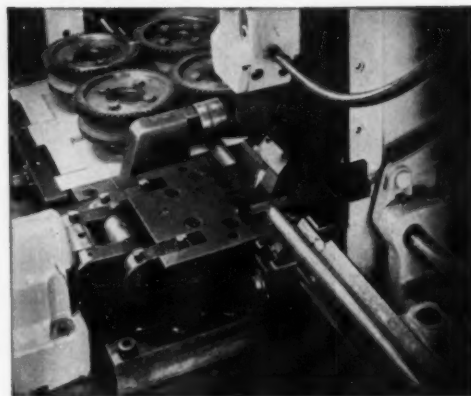


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# FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 88

## X-ray film guide

Industrial X-ray films and processing chemicals are covered in a new technical brochure and buying guide. Featured is a density-exposure chart for use with all types of industrial X-ray film. The chart, which is perforated for wall mounting or filing, covers the complete voltage range of 60 KVP to 2 MEV, including Cobalt 60 and radium gamma-ray radiation. Film sizes, developing data, and availability of chemicals are given. *Anso.*

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## Industrial spray nozzles

Twenty page, two color booklet describes firm's line of industrial spray nozzles. Well illustrated with photographs, drawings, diagrams and charts, it gives extensive information on: atomizing, "non-clog," large capacity, gas scrubbing, flat spray, hard rubber, solid spray, spiral core and spray drying nozzles. Stoneware chamber sprays, strainers, pressure regulating valves and industrial oil burner nozzles are also contained in the booklet. *Monarch Mfg. Works, Inc.*

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## Vibration monitors

A new four page bulletin describes line of manually reset vibration monitors and malfunction detectors. Included is detailed information on how vibration monitors detect malfunctions in rotating equipment and how the devices are installed and adjusted. Bulletin includes photographs, dimensional drawings and tabulated features on standard, oil-tight, and explosion-proof models. *Beta Corp.*

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## Lubricants and greases

Lubricants and greases for industry are described in detail in a new two-color catalog. Technical information on the qualities and specific uses in industry are contained on: multi-purpose greases, outside gear and track roller lubricants, gear oils with moly-disulphide, chain and gear oil, anti-seize compound, sealing compound and air-dry lubricant. *Jet-Lube, Inc.*

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## Furnace catalog

Twenty-four page bound catalog covers one firm's standard and special furnaces to 3000° F in several series. Ovens and furnaces with silicon-carbide heating elements are included. Photographs and illustrations picture recirculating air, gravity convected, and special atmosphere ovens; forced convection air draw, metal annealing, and glass annealing furnaces; and experimental manual pusher, hydraulic or mechanical pusher, and box type kilns. A detailed data sheet form is included that may be filled out by interested parties and sent back to the company. *L & L Mfg. Co.*

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## Conveyor problems

Company's line of conveyors is covered in a new piece of literature. It tells how one large manufacturer of cooking ranges solved a problem of how to move range tops from press to press during a series of stamping operations. Pictures and diagrams illustrate utilization of conveyors. *A-F Conveyors, the Alvey-Ferguson Co.*

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NEW YORK 14, N. Y.

### Micro positioning

Folder describes new way to increase production, control accuracy and eliminate jig costs on repetitive drilling, reaming and tapping jobs. Bright, well-written, illustrated reading matter describes the "Micro Positioner," a precision made automatic indexing table. It makes possible reproduction of complex drill or tapping patterns repetitively and swiftly with very little effort or operator skill required. A sensing mechanism that "feels" indentations in a steel tape directs movements of the table in the horizontal plane, either transversely or longitudinally. Dimensions and specifications are listed as well as a typical problem solved by the machine. *Micro-Positioner Corp.*

For free copy circle No. 21 on postcard

### Tool steel problems

Two of the biggest problems in working with tool steel, uncompensated shrinkage and expansion caused by heat treating, are handled in a recently published brochure. Titled "Factors to Consider About Tool Steel," it is not an exhaustive nor highly technical treatment of the subject. Rather, it is a digested brochure giving a good basic rundown on tool steel. Publishers issued it after discovering a surprisingly large number of shops either weren't familiar with the necessary information or didn't know how to use it. *Wiedemann Mach. Co.*

For free copy circle No. 22 on postcard

### Nondestructive testing

A new edition of "Seeing Isn't Always Believing" has been completely brought up to date. Some of the changes: (1) Inclusion of electronic eddy current and magnetic sensing instruments. (2) Spot-check dye penetrant has been added. (3) Inclusion of recent development of several new Zygo materials and techniques for using them. Fluorescent penetrants capable of doing a better job are covered, and (4) Combining firm's Magnaflux and Magnaglo products. *Magnaflux Corp.*

For free copy circle No. 23 on postcard

### Drafting practices

A 56-page booklet on standard and simplified drafting practices is being offered. The first section contains a speech given by Jay H. Bergen, AMF Standards Administrator, before the American Society for Engineering Education. The remaining 44 pages are devoted to the details of AMF standards on drafting room practice and simplified drafting. Twenty pages are devoted to standard drafting room practice, recently revised, cover basic drafting operations and then wind up with four pages of helpful data on general procedures. *American Machine & Foundry Co.*

For free copy circle No. 24 on postcard

### Fork lift specifications

Company's new fork lift truck is the subject of information and specification sheets on heavy-duty material handlers with wide axle front and back. Fork lift and material carriers are available in six capacities in a wide range of sizes: 12,000, 15,000, 16,000, 18,000, 20,000 and 22,000 lbs. All six wheels are standard 20-in. truck wheels. Power is supplied by a 160 hp Ford V-8 industrial overhead valve engine. *Gerlinger Carrier Co.*

For free copy circle No. 25 on postcard

### No pallets needed

Fact sheet gives rundown on machine that is said to offer all the advantages of conventional palletizers and pallet-load handling without the use of pallets. Complete details are given including a description of its operation. *Standard Conveyor Co.*

For free copy circle No. 26 on postcard

### Automatic ladling unit

Bulletin fully describes company's automatic ladling unit for aluminum. Technical data for use of equipment for fully automatic processing of many types of castings, especially aluminum die casting and permanent mold are listed. A description and specifications for a panel cubicle with controls for the ladling unit are also included. *Lindberg-Fisher Div., Lindberg Engineering Co.*

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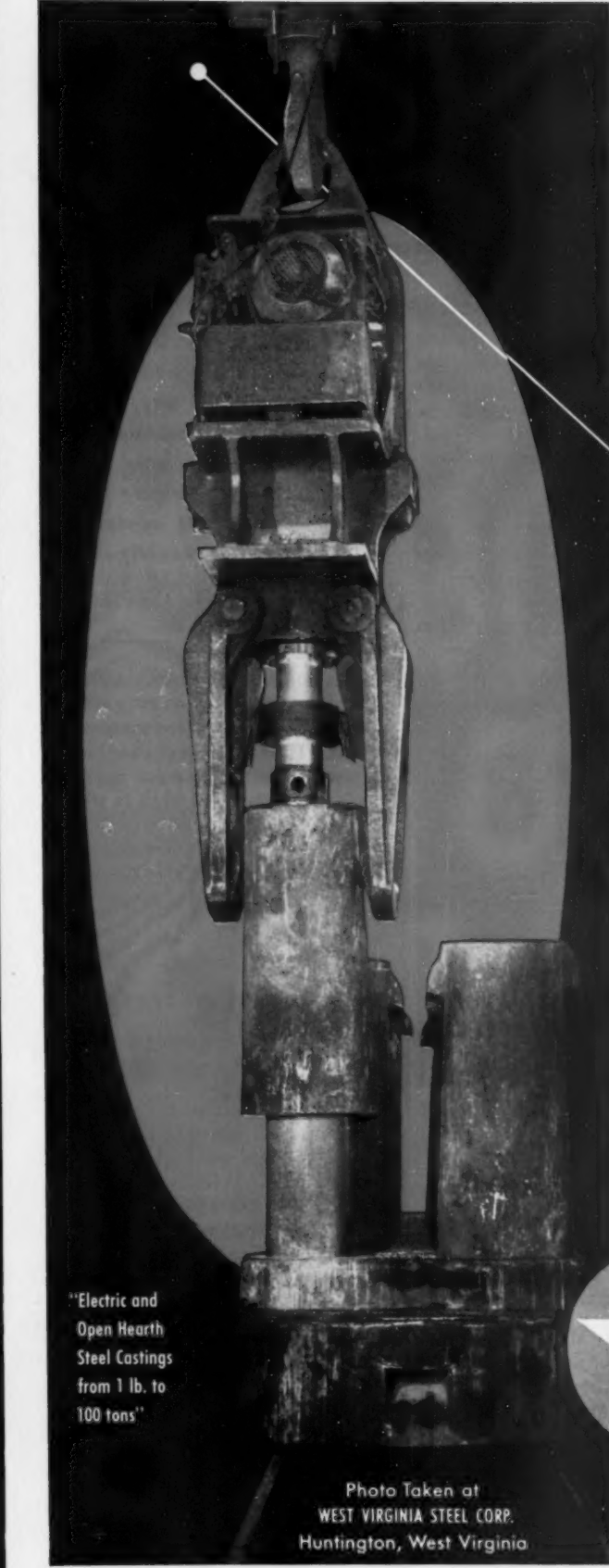
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### lower cost... greater efficiency

Present users of our Portable Ingot Stripper report savings in mold cost and reduced overhead expense as the crane can be used for other jobs when the stripper is not in use. Two sizes available—250 and 450 tons—easily modified to handle hot tops.

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## TECHNICAL BRIEFS

### HANDLING: Narrow Aisle Lifts

Materials handling equipment for operation in narrow aisles in big demand says spokesman . . . Management squeezes up to 1/3 more space out of bulging at the seams warehouses.

Management in 1956 is making a big drive to use all possible existing warehouse space by means of materials handling equipment that can operate in narrower aisles.

That is the conclusion of A. L. Lewis, president of Lewis-Shepard Products, Inc., Watertown, Mass., manufacturer of fork trucks and related equipment. He says narrow aisle equipment is in greater demand than ever before.

High warehouse construction cost and need for carrying heavier inventories in some areas of busi-



**This Yale truck is an example of narrow aisle operation.**

ness are credited with causing industry to squeeze more storage area out of its available space rather than build anew.

#### Maneuver in Six Ft Aisles

Most popular equipment now on the market can maneuver in aisles six or seven ft wide compared with previous aisle limits of 10 to 12 ft. By cutting down its aisle widths and stacking higher, industry has discovered that warehouses which seemed to be bulging at the seams can hold as much as a third more goods, he believes.

#### WANT MORE DATA?

*You may secure additional information on any item briefed in this section by using the reply card on page 93. Just indicate the page on which it appears. Be sure to note exactly the information wanted.*

His company is looking forward to the best of its 41 years in manufacturing. They offer seven new models incorporating two basic types of electric-powered narrow-aisle equipment: the kind in which the operator rides; and the "walkie" type, in which the operator, who walks alongside, directs the trucks by means of a control handle.

### Metallurgy:

**Second annual titanium lecture to be held**

The second annual titanium lecture program for practicing engineers will be conducted at the New York University College of Engineering September 10-14.

Titanium authorities from industry and research laboratories, together with members of the NYU faculty, will present 25 lectures. The roster will include the two leading British authorities on titanium, Dr. Alan D. McQuillan of the University of Birmingham and his wife, Marian McQuillan of Imperial Chemical Industries.

Subjects to be covered are: Sept. 10, Extraction and Melting; Sept. 11, Phase Diagrams, Metallography and Alloying; Sept. 12, Heat



Treatment and Mechanical Properties; Sept. 13, Mechanical Metallurgy and Applications; Sept. 14, Fabrication.

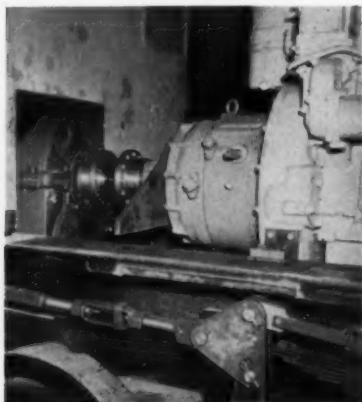
Attendance will be limited and applicants may register until August 15. Information and applications can be obtained by writing to Dr. Harold Margolin, New York University College of Engineering, University Heights 53, N. Y.

## Hauling:

### Hydraulic locomotives rapidly finding acceptance

Employing a clutch and change gears, a mechanical system is by far the most widely known type of transmission interposed between an internal combustion engine and a vehicle's driven wheels.

However, like the automatic transmission automobile, hydraulic diesel locomotives are rapidly finding acceptance in switching



**Twin-Disc hydraulic torque converter on Cat diesel engine.**

yards, mill railroads and even in mining operations. If the latest engine of this type proves successful, at least one large eastern railroad will abandon some of its diesel-electric engines.

#### Elimination of Equipment

Advantages of the hydraulic locomotive include, of course, complete elimination of all generators, wiring, controls, motors and



CVC's 350-1000 pound vacuum furnace in Westinghouse plant at Blairsville, Pa.

## How Westinghouse makes new alloys from old with high vacuum

Reduce the pressure in a chamber to  $\frac{1}{500,000}$  of sea level atmosphere. Now melt a conventional alloy in the chamber.

As the alloy melts, structural bonds are broken. Oxygen, hydrogen, and other so-called impurities are liberated and pumped away. The result: such marked improvements that for all practical purposes the alloy can be considered a new one.

The CVC high-vacuum furnace shown above creates the necessary low pressure quickly and economically.

The metals coming from the furnace show superior quality in such characteristics as fatigue resistance,

rupture strength, tensile strength, tensile ductility, and forgeability.

DISCALOY, REFRACALLOY, and HIPERNIK\* are but a few of the vacuum-melted alloys under development at Westinghouse for such applications as gas turbine discs, blading materials and transformers. Some alloy grades of S.A.E. steel are also being studied for further use in bearing and structural parts.

If you have a problem in metallurgy—or in electronics, nucleonics, distillation, or metal and plastic finishing—which high-vacuum techniques might solve, we'll be glad to discuss it with you.

\*Westinghouse trademarks

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*from tea strainers...*



*to catalytic crackers...*

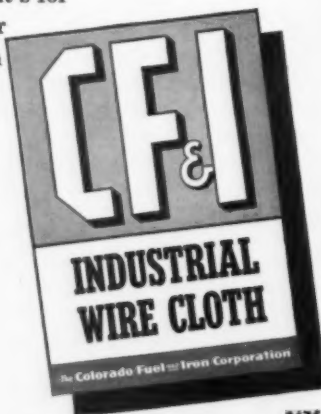
*you will find*



## INDUSTRIAL WIRE CLOTH

It's a versatile product, this CF&I Industrial Wire Cloth. For it plays an essential part in the tiny tea strainer and in the oil refinery's huge catalytic cracker. Chances are that you're using it—or could be using it—to good advantage right in your own operations.

CF&I Industrial Wire Cloth will meet your most exacting specifications—whether it's for screening, filtering, grading, cleaning or processing. That's because CF&I Cloth comes in a wide variety of weaves and meshes and can be supplied in non-ferrous metals, as well as carbon and alloy steels. Why not get the complete details from your nearby CF&I representative today!



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### TECHNICAL BRIEFS

other space and dollar consuming equipment normally used in diesel-electrics.

Harlan T. Ross, president of the Upper Merion & Plymouth Ry., a subsidiary of the Alan Wood Steel Co., believes that the perfection of the torque-converter equipped diesel will be a boon to industrial and mill carriers. He stresses the fact that his road has different needs from the New York Central RR., which is now testing its "Train X" engine for hauling passengers. Unlike "Train X," built by Baldwin-Lima-Hamilton Corp., the Upper Merion & Plymouth's engines are frequently stopping and start-



**Hydraulic locomotive weighing 65 tons hauls string of boxcars.**

ing. There is hardly any need for the Central Train X's 120 mph reported top speed.

### Meet Many Demands

However, hydraulic locomotives are said to meet both these and many other transportation demands. The Plymouth Locomotive Works, a div. of Fate-Root-Heath Co., Plymouth, Ohio, has been producing a varying fleet of locomotives for a wide variety of uses. Among these are: a five ton mining loco, a ten-ton light puller and shunter, 20, 25 and 30 ton switcher-haulers, 60 and 65 ton locomotives, a massive 80 ton twin unit, and very many more. All are reported to have excellent pickup and pulling power, even on considerable grades.

Plymouth locomotives utilize Twin-Disc, Fuller and Allison torque converters, along with Continental, GM, Hercules, Caterpillar, Cummins Waukesha, LeRoi,

International, Ford, Climax, Cooper-Bessemer, and Buda diesel engines. They include 48 to 500 hp engines. Torque-converter locomotives have been produced by Plymouth to burn virtually any kind of fuel, including kerosene, distillate, gasoline, alcohol, diesel, butane and propane.

These locomotives are not in the experimental stage. They have been in production for several years and customers are reported satisfied.

#### Location of Converter

The hydraulic torque-converter is located on the engine's fly-wheel housing and connected to the locomotive transmission by a self-aligning coupling. Power is delivered from the engine to the torque-converter where it is automatically multiplied to meet the existing demand of the locomotive load. The torque converter is then transmitted to the transmission; to the final drive shaft; to the driving sprockets; to the chains; the axle sprockets and the wheels.

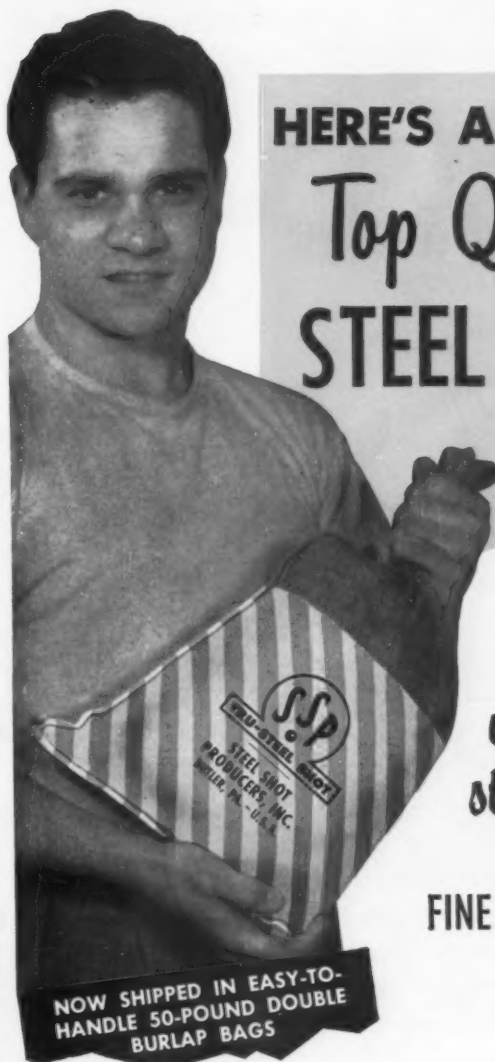
Among the advantages reported: Equal speeds can be attained either forward or reverse. Elimination of jerky starts, an infinite number of speed ratios within its range including zero, versatility in speed and power range, vibration reduction, cushioned shock loads, elimination of engine stalling or overload, few wearing parts along with reduced wear due to shock absorbing features, uninterrupted application of power within range, reduction of operator fatigue and, of course, more economical operation.

### Welding:

**Worm gear jacks utilized to raise, lower positioners**

Use of worm gear jacks to raise and lower frames of pedestal welding positioners is enabling Worthington Corp. to achieve more accurate positioning while reducing production costs substantially.

The Plainfield, N. J., firm incor-



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STEEL SHOT**

**MADE TO  
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## GLAD I CALLED IN "ELL" AND "ESS"!

No, this isn't a junk man's dream.

These are just the parts for a new product—*without bolts and nuts!*

And it's about time our friend called in "ELL" & "ESS" for expert advice on "how to fasten it".

Selection of the *right* fastener for the job at hand is important in many ways: assembly efficiency on the production line, ability to do the holding job at minimum cost and smooth operation of the finished product.

Consumer products must also have "sales appeal" appearance.

So don't guess—Call in "Ell" & "Ess". There's no charge and they may save you a pretty penny!



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PLANTS AT CLEVELAND AND KENT, OHIO • BIRMINGHAM • CHICAGO



## TECHNICAL BRIEFS

porates Duff-Norton jacks into four of nine welding positioners. Powered by an electric motor, a single jack can lift 50 tons eight in. in 60 seconds at the touch of a push button. Eventually, all models are expected to be power elevated.

Formerly, Worthington welding positioners required an overhead crane to raise or lower frames. The frames were secured by inserting pins into the columns on which they moved.

The operation required two men, one to operate the crane and the other to insert the pin. If the crane was in use elsewhere in the shop, costly delays resulted while



**This jack lifts 50 tons eight inches in 60 seconds.**

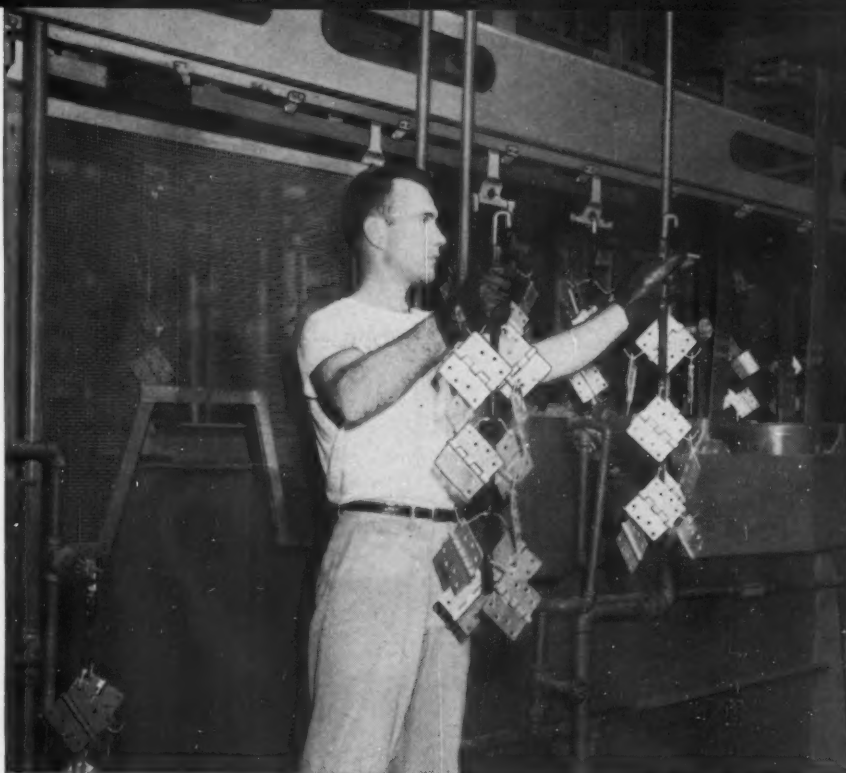
the welder waited for the positioner frame to be moved.

The jacks come in package units as a complete assembly and are easily adapted to present equipment. The gear head motor is connected by direct coupling to the impact shaft of the Duff-Norton worm gear jack.

### Two Major Advantages

Worm gear jacks are said to offer two major advantages: (1) They are self-locking to eliminate any possibility of slipping or creeping under load. (2) Their initial cost is lower.

Jack capacities range from 5 to 50 tons, depending on the model welding positioner on which they will be used. Raise of the jacks varies from eight to 30 in. Jacks will hold a load in a fixed position indefinitely because power is required to raise or lower them.



## PRODUCTION INCREASED— UNIT COSTS LOWERED with UDYLITE AUTOMATIC PLATING MACHINES

Each day, over twenty thousand door hinges are cadmium, copper and brass plated by three Udylite automatic machines owned by C. Hager & Sons Hinge Manufacturing Company, St. Louis, Missouri. Cadmium plating is for protection from rust and corrosion—the copper and brass plating for a gleaming, luxurious finish.

The Hager Company installed these machines five years ago when it was decided to eliminate their hand operations. Production has increased one hundred fifty percent with the Udylite Automatics—the finishes are more uniform—the rejects reduced to practically nil, and as with most Udylite machines, there is very little maintenance.

Have you checked your metal finishing operations lately? If you do plating, anodizing, blackening, or other types of metal finishing in volume, you should investigate the Udylite automatic equipment and Udylite finishing processes. They are known the world over.



WORLD'S LARGEST  
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# Cincinnati Shear's and ACCURATE

*Photos courtesy Despatch Oven Company, Minneapolis, Minnesota.*



New front controlled power back gauges are now standard equipment on ALL CINCINNATI SHEARS.

**fast, easy**

**gauge setting... ***SAVES TIME!*****

Cincinnati features bring speed and accuracy in turning out panels for industrial ovens at the Despatch Oven Company.

5' x 10' sheets are trimmed four sides—corners are square, sides are clean and straight and panels are sheared accurately to size.

Cincinnati quick, convenient and positive gauging, accurate knife alignment and powerful hydraulic hold-downs speed performance.

Despatch Oven Company say—"This shear has brought an operating time saving, reduced time for maintenance. Performance very good."

**Write for Shear Catalog S-7.  
If you shear we can help you.**

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## Hendrick Adds Class to Living Rooms and → Locker Rooms →

More and more designers are including Hendrick Perforated Metal in the fabrication of new products. Typical of these is one company who manufactures the attractive room divider shown above using Hendrick Perforated Metal Square Link design. Another manufacturer installs an attractive Hendrick Ornamental Metal Grille on linen closet and locker doors.



And there are thousands of other applications where Hendrick Perforated Metal has added to product style and functionalism. For information on the type of perforated metal or grille best suited to your needs, call Hendrick today.



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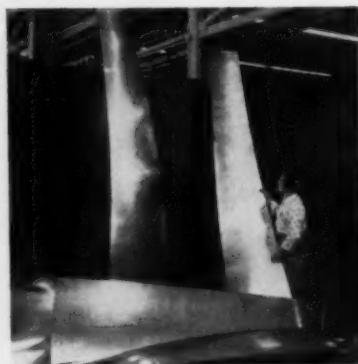
## TECHNICAL BRIEFS

### Forming:

**Radial draw techniques  
contour tapered sections**

Successful results in contour forming of tapered sections has been announced by The Cyril Bath Co. New developments now permit forming, in one operation, of parts either tapering from end to end or varying in cross-sectional area throughout the piece.

Conventional stretch forming techniques are identified as usually not satisfactory because the tonnages necessary to set contour of heavier parts would fracture or



**Contour formed tapered sections  
are produced in one operation.**

over-stress lighter areas. It has often previously been necessary to create long tapered sections either by joining several shorter pieces or by machining the taper after setting the contour.

#### Employ New Techniques

New techniques employ use of a radial draw form machine (tension cylinder with rotary table and contour die) with traverse compression unit.

In one technique, the radial draw former stretch-forms the contour at tonnages suitable to material's lighter cross-sectional area. Simultaneously, the hydraulic ram unit exerts pressure at the point of tangency of the material and the contour die and progressively increases the pressure to accurately form the heavier cross-sectional areas. Thus, both stretch and compression methods are used simultaneously.

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Unlike common greases, NON-FLUID OIL does not require heat softening in order to start lubricating . . . your pressure-lubricated machinery runs smoothly *continuously* and with no heating or wear of bearings, and no "down time" for repairs due to inadequate lubrication.

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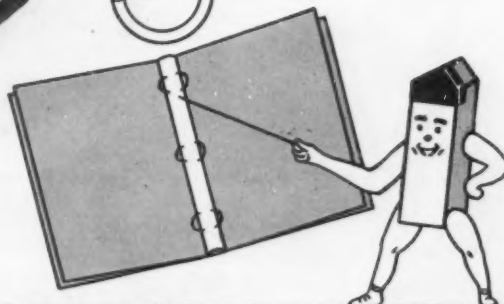
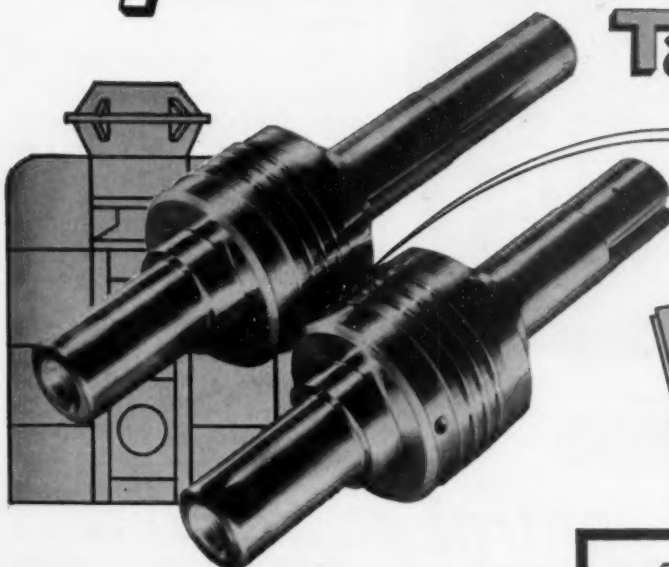
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**NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.**

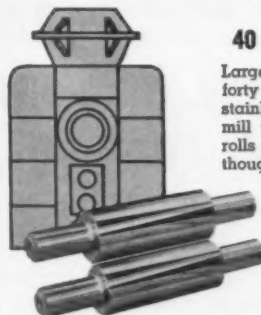


# 7 years' continuous service with **Talide® ROLLS** (TUNGSTEN CARBIDE)



● A large Eastern Producer of oval-shape wire for loose-leaf notebook rings was experiencing excessive wear and pick-up. The high scrap rate was making the item unprofitable. Metal Carbides service engineers were called in to determine if Talide rolls could correct the trouble. Hi-carbon wire was being reduced on a 2-hi cold rolling mill to an oval shape .100" thick x .156" wide. Considerable stress and pressure was required to deform the wire to proper shape.

Our engineers designed a roll incorporating a carbide sleeve having 3 grooves ground in periphery and mounted to a special alloy steel arbor. The initial pair of rolls was installed in 1948 and has been in continuous service ever since. Due to their extreme hardness it has not been necessary to remove them from the mill during this 7-year period—not even for a regrind! Size and shape of wire has been perfectly maintained. Customer has since installed similar rolls on all their mills.



## 40 TIMES MORE TONNAGE

Large Steel Producer cold rolls forty 3,000 lb. coils (60 tons) of 18-8 stainless steel, series 300, on 4-hi mill with one pair of solid Talide rolls with no surface wear, even though strip work hardens to 50 Rockwell "C" in one pass. Flatter, smoother strip produced—even when rolling intermittent widths. 40 pairs of steel rolls were required previously to produce same tonnage.

## SUPERSET GRINDING WHEEL



The Superset diamond grinding wheel was specially developed for grinding carbide rolls to highest possible surface finish and luster. Made of 4-8 micron size diamond dust, it imparts a surface finish far superior to any other commercial wheel. Available in sizes up to 25" diameter.

## EXCLUSIVE REPAIR SERVICE



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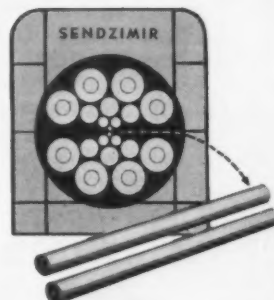
Broken or damaged carbide rolls can be re-worked to first class condition with all defects eliminated at one-half original cost. Only Metal Carbides offers this service—because of its exclusive hot press method.

Metal Carbides Corporation,  
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## ROLL LIFE INCREASED 278 to 1!

All users of Sendzimir rolling mills have adopted Talide work rolls because operating results have been phenomenal, far surpassing all expectations. Tremendous production runs are commonplace with mill after mill reporting increased tonnage runs between roll changes of 278-1, 179-1, 82-1, etc.



Talide rolls are made in lengths up to 100", diameters up to 25", and up to 5000 pounds by weight.



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OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

**Have you seen what this  
CAN DO  
FOR YOU ?**



## **Torque control IMPACTOOL**

**NEW accuracy and speed for  
precision nut running jobs...**

- **POSITIVE TORQUE CONTROL**—a revolutionary use of a rugged steel torsion bar for precision control of torque—combined with the power and speed of the Impactool.
- **SIMPLE TORQUE SETTING**—torsion bar adjusting sleeve is clearly calibrated for changing torque with easy-to-use torque jig.
- **TORQUE SETTING REMAINS CONSTANT**—for any nut running condition until the adjustment is changed.
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- **REVERSIBLE**—full power in either direction.
- **NO CLUTCH**—to wear, slip or require adjustments.

### **\* 2 TORSION BARS PROVIDE MULTIPLE TORQUE SETTINGS**

Get a free demonstration of Ingersoll-Rand Torque Control Impactools by an I-R AIR engineer now... or write for additional information.

• No. L735 Max. torque 60 ft. lbs.

• No. H735 Max. torque 90 ft. lbs.

For torques up to 550 ft. lbs. a Size 5340T Torque Control Impactool is available.

# **Ingersoll-Rand**

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## **TECHNICAL BRIEFS**

Pieces are formed accurately and further machining is virtually eliminated.

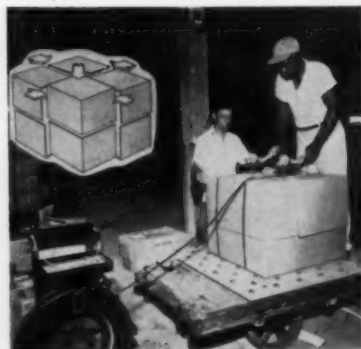
### **Hydraulic Ram Unit**

A second technique employs the hydraulic ram unit as an additional gripper. The wipe shoe member is provided with a rubber backed contact face so that, under pressure, it will be self-adjusting to the contour die at any point. The lighter section of the piece is first set to contour with suitable relatively light stretch tonnage. The ram shoe is then brought into contact with the material part way along the piece contour and sufficiently forced against the sheet and die to act as an additional gripper. Stretch tonnages may then be increased to sufficiently set the heavier areas of the piece. This relocation of the holding shoe and increase in stretch tonnage may be several times repeated in long parts.

## **Packaging:**

**Box so simple, should have  
been thought-of before**

So simple that its makers wonder why somebody didn't think of it before, a new container, in three sizes, does the work of 800 master packages.



**Many containers in one (see insert) are strapped together.**

To make one up, eight separate pieces of scored and slotted corrugated board with no right or left sides and no top or bottom are used. They telescope together to form

one outer container. Then they are secured with steel strapping.

Commodities that can be packed in this way are almost limitless. Among other things, it has been successfully used for tire tubes, insulation materials, rolls and bolts of fabric, coils of tubing, airplane engine and radio parts.

Need is eliminated for exact size or custom cartons. Other savings claimed include storage space (up to 94 pct (company says), marking, warehousing, shipping, handling and labor. Both drop and exposure tests have proven it to be completely satisfactory for overpacking.

#### Primary Purpose

Although new uses are found almost daily for them, company does not intend to replace regular containers for production line packing. Rather, they are designed to make possible the overpacking of many non-standard orders which ordinarily require large quantities of assorted size master containers says the makers, Signode Steel Strapping Co., Chicago.

### Metals:

#### Corrugated aluminum roof sheet is used

Corrugated aluminum roofing sheet is said to have proved to be an attractive and economical covering for two new giant dome-shaped gypsum storage buildings of Kaiser Gypsum Company, Inc.



Aluminum sheet over steel frame roof looks like giant spider web.

The unusual buildings, one at Long Beach and one at Antioch,

## AIR engineering at work REPORT No. 5098B-3

### Multiple Screw Driver

*assembles 400*

*carburetors per hour*

Assembling carburetors was a slow, one-screw-at-a-time operation until AIR engineering solved the bottleneck. Now one operator uses this 8-spindle automatic Multiple Screw Driver to help turn out more than 6 completed carburetors per minute—400 every hour.

This compact, easy-to-operate Multiple Screw Driver is just one more example of how AIR engineering is helping modern industry solve problems and cut production time and costs.

All the experience of Ingersoll-Rand in speeding up fastening through AIR engineering multiple units is yours for the asking. Whether your operations involve screw-driving or nut running with either hand-held or automatic production line units, Ingersoll-Rand can engineer and build just the unit best suited to your needs.



8-Spindle Multiple Screw Driver for carburetor assembly.

Drop us a line if you'd like an AIR engineer to analyze and make recommendations on your fastening operations.

# Ingersoll-Rand

11 Broadway, New York 4, N.Y.

8-341

California, are identical. Each rises 70 ft above yard level, spans 175 ft at the spring line, has 16 rectilinear segments and has a storage capacity of 35,000 tons of gypsum rock.

Dome-shaped structures offer advantages of maximum use of space, conforming with the general shape of piled loose material, and a relatively light structural system of only about half the weight of a

conventionally designed building. In addition, the dome shape provides greater stability pound for pound, and greater wind and earthquake resistance.

The corrugated aluminum industrial roofing sheets were fastened to the structural members by end-welded composite aluminum Riv-weld studs. Altogether, 12,000 aluminum studs were welded to the steel framework.



## ... To Your Specifications

**ERIE Bolts • Studs • Cap Screws • Nuts**  
In Alloys • Stainless • Carbon • Bronze

Your most exacting specifications take precision form in the hands of our expert craftsmen. Bolts—Studs—Cap Screws—Nuts as specified to resist corrosion, extreme temperatures and tensile stresses are the product of more than 40 years continuous production of highest quality fasteners for a wide diversity of industries.

Send us your specifications for prompt estimate.



**ERIE BOLT & NUT CO.**  
Erie, Pennsylvania  
Representatives in Principal Cities

## Methods:

### Furnace cooling problem handled with regulator

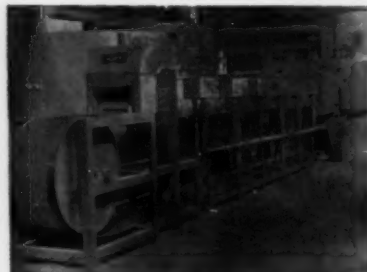
How do you eliminate fluctuating temperatures in the cooling chamber of a continuous atmosphere furnace?

One firm, the Powers Regulator Co., Stokie, Ill., replaced an electric control on the water jacket with a gradual-acting self-operating temperature regulator.

The furnace manufacturer, Lindberg Engineering Company, Chicago, makes conveyor-type continuous atmosphere furnaces for brazing, sintering, and annealing. Average length of the furnaces is 60 ft, although they have been made as long as 240 ft.

#### Critical Part

Cooling is a critical part of the furnace operation. Metal parts



**Temperature control in water jacket posed a problem.**

emerge from the heating chamber at temperatures as high as 2050°F, and must be cooled to 400°.

Water-jacketed cooling chambers, made in eight ft sections joined together, absorb and dissipate the heat. Previously, Lindberg used an automatic solenoid control to open and close the flow of cold water in the water jacket.

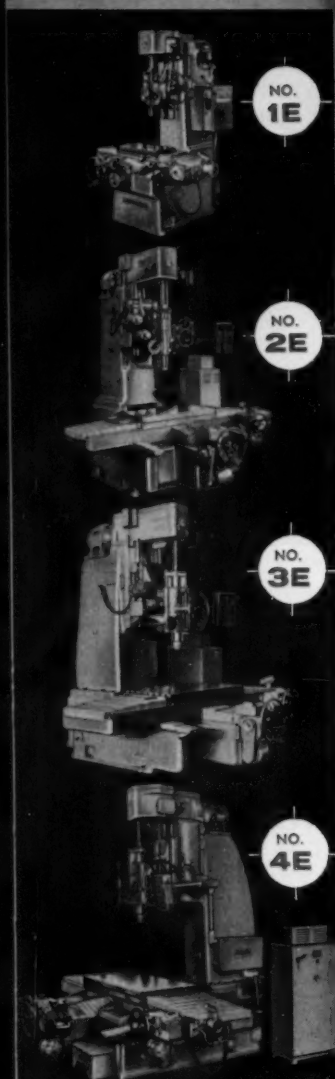
#### Water Temperature Varied

Because of the all-or-nothing response characteristic of the solenoid, water temperature varied widely from the desired 150°F. In turn, the atmosphere within the cooling chamber fluctuated, affecting the physical properties of the metal parts being cooled.

For users of the furnace, this



Get  
to the POINT... *in a hurry!*



*with*

## **PRATT & WHITNEY** *Electrolimit* JIG BORERS

The point we'd like to make is that Pratt & Whitney Electrolimit Jig Borers incorporate an exclusive method of locating the table that is *unbeatably* fast and convenient . . . and accurate to .0001". Thanks to the P&W Precision Preloaded Ball Roll Quill, you'll be able to retain original accuracy and rigidity *indefinitely* without any adjustment or maintenance.

And there'll never be any loss of accuracy from wear.

NOW . . . Pratt & Whitney Electrolimit Jig Borers can also be furnished with positioning control by NUMERICAL DATA.

. . . COMPLETE LINE includes table sizes from 12"x24" to 36"x72".

Write for free copy of P&W Electrolimit Jig Borer Circular No. 587 . . .

**ALSO FURNISHED . . .** a full line of Pratt & Whitney End Measure Jig Borers which also deliver "tenths" accuracy year after year.



**PRATT & WHITNEY COMPANY**  
INCORPORATED

10 Charter Oak Boulevard, West Hartford, Connecticut

Representatives in Principal Cities Throughout The Country

MACHINE TOOLS • GAGES • CUTTING TOOLS

meant that precise duplication of brazing, sintering, and annealing procedures was difficult. Finished parts could and did vary in quality from one run to another.

Lindberg engineers then improved the furnace by replacing the solenoid control with a self-operating temperature regulator.

The liquid-filled bulb of the regulator is placed within each water jacket section. The control valve

is installed on the water line to the jacket, and is set at 150°F.

A temperature change at the bulb varies the pressure of the volatile liquid in the bulb. Pressure is transmitted through flexible tubing to the diaphragm bellows in the control, which operates the valve in a gradual manner. This regulates the flow of cold water into the jacket necessary to hold it at a constant temperature.

## Manufacturing:

### Stainless steel tubing used in coil, rods

Iron oxide contamination is prevented by using cold drawn stainless steel tubing in building equipment for centering helix wire in coiled heater rods of electric ranges. The producer, S. A. Oakley Co., Stokie, Ill., also uses it for making filling rods with magnesium oxide insulator.

Heater rods are of metal tubing which houses helix wire that converts electrical energy into heat. Magnesium oxide is packed around the wire to insulate it electrically from housing yet permit good heat transfer.

It is important to prevent iron oxide from contaminating Magnesium oxide because iron oxide



Equipment consists of 24 sets of long stainless tubes.

is not an insulator and could cause a short circuit between helix wire and coil shell.

To prevent formation of contaminating iron oxide, Oakley makes equipment for filling the heater rods from type 304 stainless steel. This metal is completely oxidation resistant at room temperatures.

Essentially the filling equipment consists of 24 sets of long stainless tubes cut from tubing supplied to Oakley by the Superior Tube Co., Norristown, Pa. Each set of filler tubes is made up of one tube telescoped into another.

# Titusville Forge

Your logical  
SOURCE OF SUPPLY  
for...

- CRANKSHAFTS—Diesel, Press, Pump, etc.
- CYLINDERS—Hydraulic Press, Gate Hoisting, etc.
- ROLLS—Bending, Straightening, Table, Engraving, Crusher, Pulverizer
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- MILL SPINDLES and COUPLINGS
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- SHAFTS and PINIONS
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Barrel Cases, Rocker Shafts, Hollow Rolls
- PISTON RODS
- DIE BLOCKS (T TEMPER)



**STRUTHERS WELLS CORPORATION**

TITUSVILLE FORGE DIVISION

TITUSVILLE, PA.

PLANTS AT TITUSVILLE, PA., and WARREN, PA.

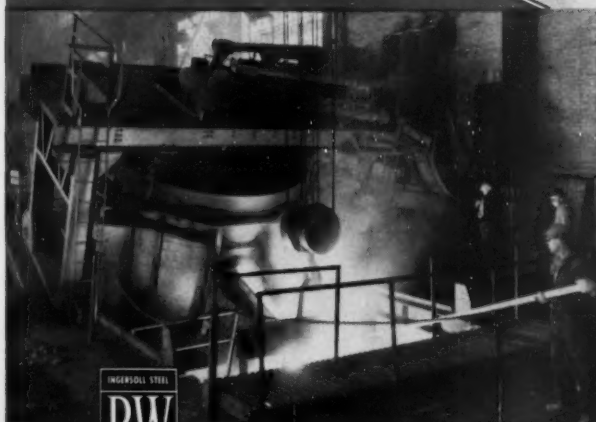
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**LOWER  
COST**

**EASIER  
FABRICATING**

# IngAclad

**STAINLESS-CLAD STEEL**



**Ingersoll**

STEEL DIVISION BORG-WARNER CORPORATION

370 S. Michigan Avenue • Chicago 4, Illinois • Plant: New Castle, Indiana

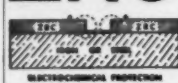
With its standard cladding of 20% solid stainless inseparably bonded to an 80% backing of carbon steel, IngAclad costs substantially less than solid stainless.

Easier to fabricate, too. Can be bent, twisted, punched, formed, drawn—yet requires no special equipment.

Plus—all the corrosion resistance and protective properties of solid stainless on the clad side.

See how IngAclad may be the answer to your stainless cost problems. Write, wire or phone for details.

## ZRC



**You can stop rust  
and rust creepage  
instantly—get years of**

### **GALVANIC PROTECTION WITH ZRC®**

One coat of ZRC on any iron or steel surface will provide galvanic protection equal (and in many respects superior) to electroplating or hot dip galvanizing.

And ZRC is equally effective on new metal or over rust — surface requires only a light wire brushing to remove loose scale.

ZRC is easy to apply by spray gun or paint brush (small articles can be dipped)—comes ready mixed in a single container, has unlimited shelf life and does not require constant stirring.

ZRC contains 95% pure zinc — dries in 30 minutes to a tough, flexible and firmly adherent coating that can be built up to any thickness.

Cost averages 1½ to 1¾¢ per sq. ft. depending on quantity. ZRC is used in new building and ship construction, plant and facilities maintenance and in manufacture of original equipment.

For price, ordering information and technical data write to

**THE SEALUBE COMPANY**  
14 VALLEY ST., WAKEFIELD, MASS.

## *the ONLY* PORTABLE NIBBLER

*that CUTS 10 Gauge Steel  
Without Distortion!*

A big statement... and only Fenway can make it! Our portable Nibblers have solved unusual problems for hundreds of users. Complete line includes the 14 gauge Nibbler and a light-duty 18 gauge Nibbler, and a special 90° head for each.

RCA — DU PONT — GENERAL MOTORS — and many others, use Fenway Portable Nibblers!

ALSO AVAILABLE: COR-RUGATED, JIGSAW ASSEMBLY & AIR TOOLS  
WIRE • PHONE • WRITE for complete information



Model HN for 10 gauge Stainless Steel and 8 gauge Mild Steel. 6" radius.



Model MN for 14 gauge Stainless Steel and 13 gauge Mild Steel. 1" radius.

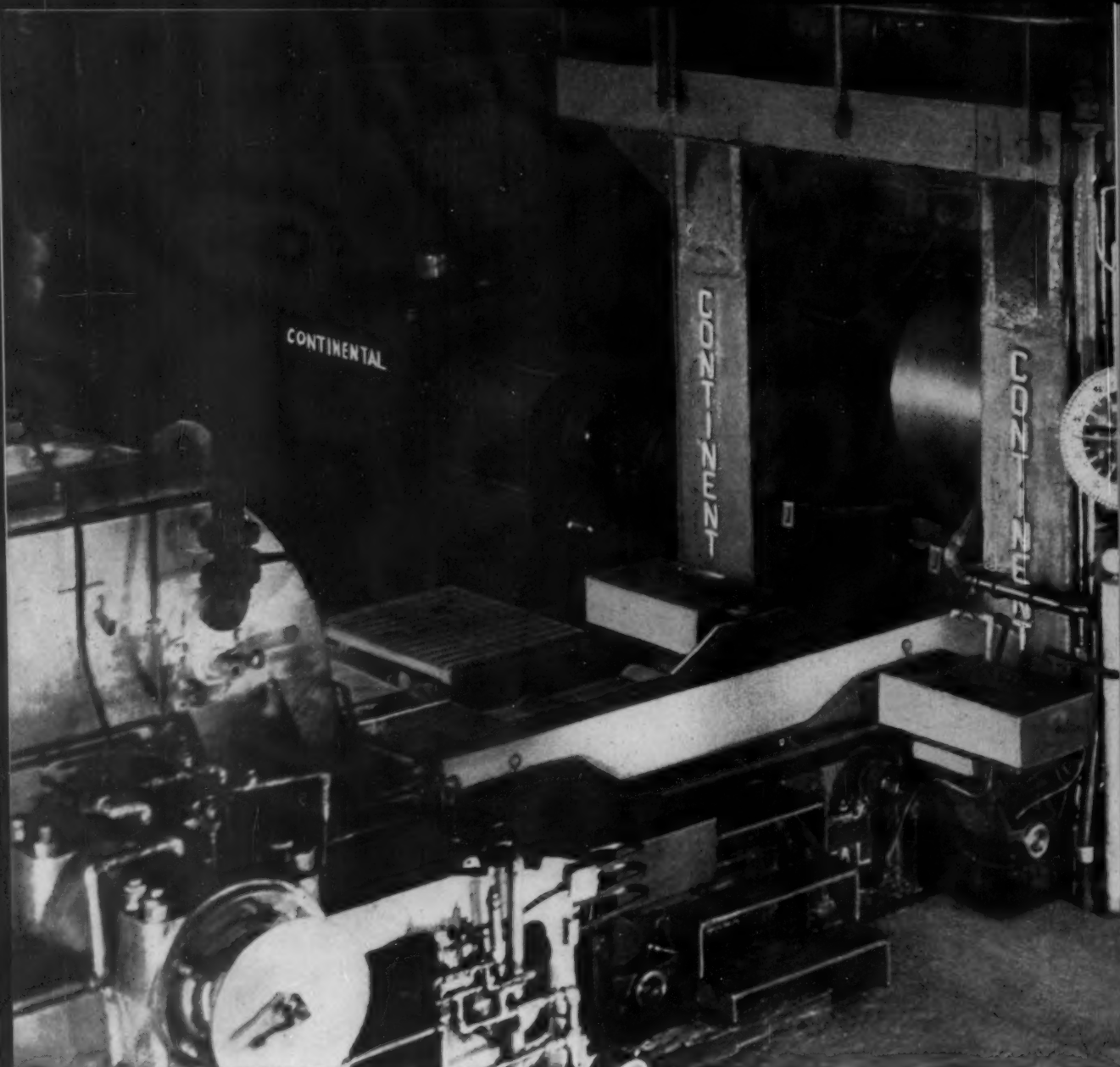
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MACHINE  
COMPANY, INC.

Edgemont & Clementine Sts.  
Philadelphia 34, Penna.

Distributed by EASCO PRODUCTS

PAT. #2278174 #7270311 #2535631



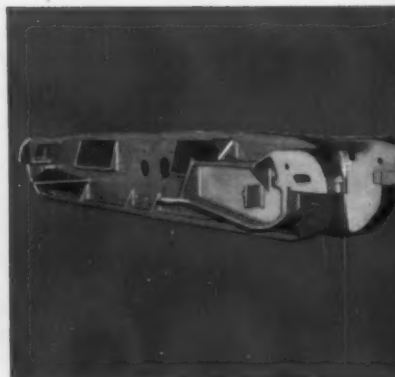
**CONTINENTAL** 26" x 49" x 66", 4-high reversing hot strip mill in the Newport Steel Corporation Plant, Newport, Kentucky.



**ROLLS**—Iron, alloy iron and steel rolls for all types of rolling mills.

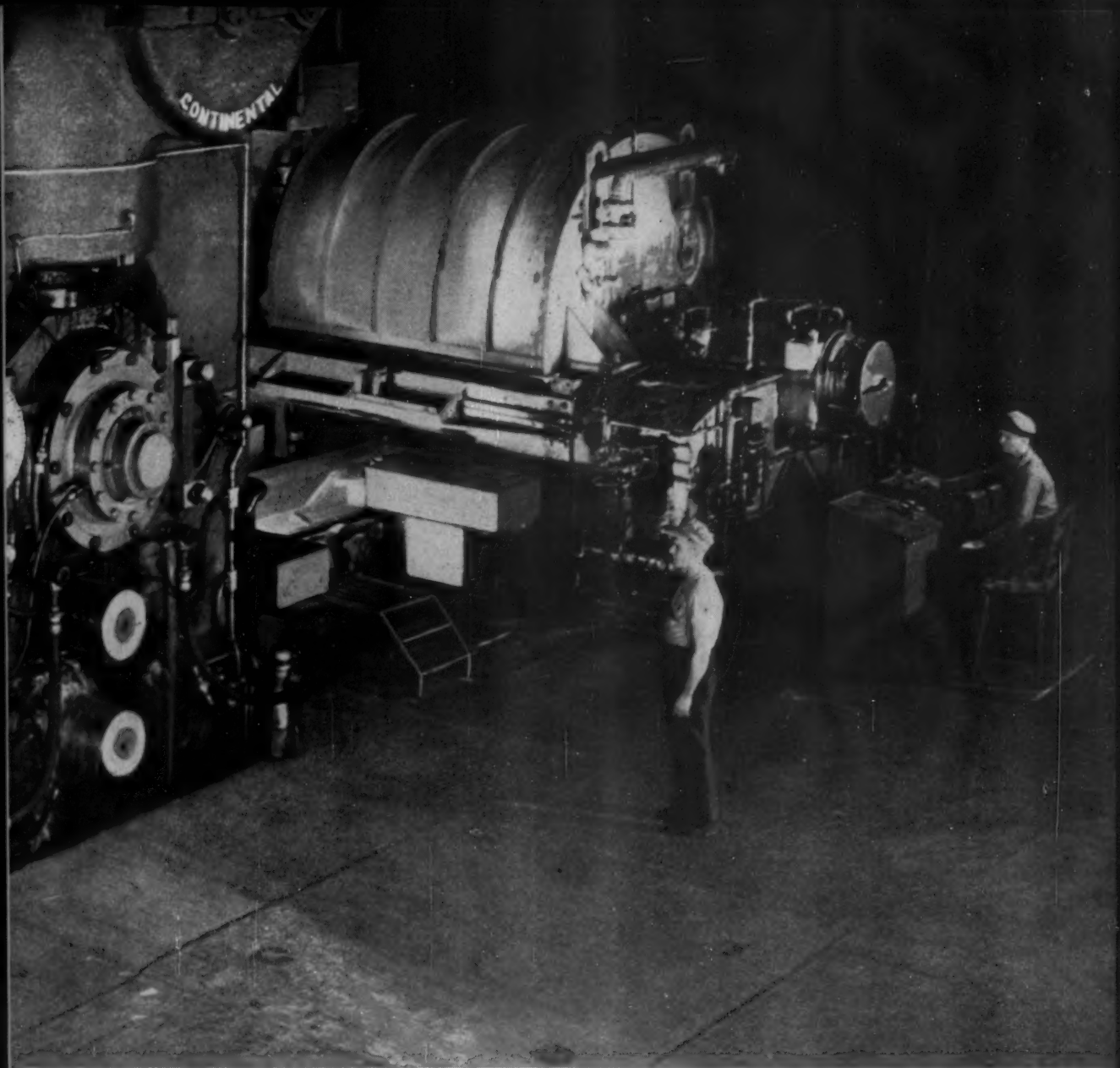


**CASTINGS**—carbon and alloy steel castings from 20 to 250,000 pounds.



**WELDMENTS**—fabricated steel plate, or cast-weld design.





***BLAW-KNOX makes what it takes***  
***to roll precision-gage hot strip directly from ingots***

Precision-gage hot strip is rolled directly from ingots by this modern CONTINENTAL 66-inch 4-high reversing hot strip mill in the Newport Steel Plant at Newport, Kentucky.

A full range of gages and analyses, including carbon and special grades of steel, are rolled by this 26" x 49" x 66" mill. The mill was designed to incorporate an existing 4000 hp. d.c. reversing motor through a pinion stand.

Blaw-Knox designs and builds *complete* rolling mill installations—assumes un-

divided responsibility from preliminary engineering to satisfactory operation. At any time we'll be glad to discuss your plans with you.

**BLAW-KNOX COMPANY**  
**Foundry and Mill Machinery Division**

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Complete Rolling Mill Installations . . . including all auxiliary equipment . . . for ferrous and non-ferrous metals

Hot strip mills • cold strip mills • slabbing mills • temper mills • universal mills • plate mills • blooming mills • structural mills • rail mills • billet mills • rod mills • merchant mills • roll lathes • chippers • special machinery • and complete auxiliary equipment.

*50th Anniversary*



## Testing:

### Force transducer measures solid fuel thrust

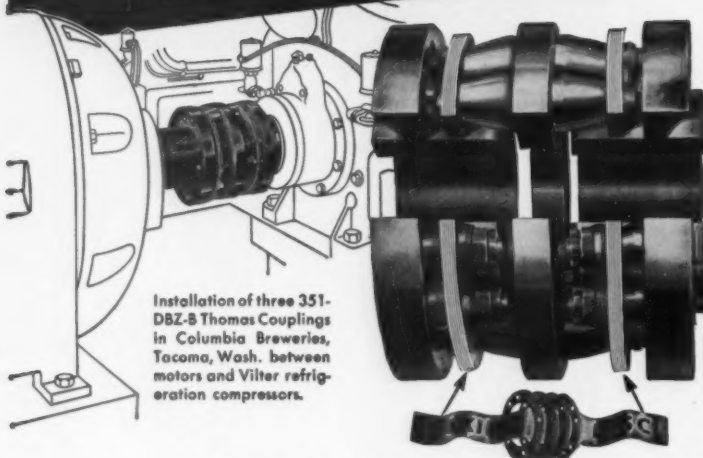
To measure extremely high frequency variations of thrust imparted by explosive reactions of solid propellant rockets, Baldwin-Lima-Hamilton Corp. has designed and produced a special transducer of force. This transducer is a load cell of 20,000 lb capacity with maxi-



Tungsten carbide bases boost load cell frequency response.

mum deflection of only 0.0005 in. under full load. This provides a natural mechanical frequency response of about 1900 cycles per second, more than twice that of previous cells. Full capacity thrust on this cell was recently measured in three microseconds during a rocket test. Resistance wire strain gages used in these cells report almost instantaneous strain response.

## THOMAS FLEXIBLE COUPLINGS... for more years of better service!



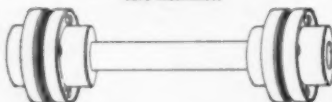
Installation of three 351-DBZ-8 Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



Write for our new Engineering Catalog No. 31A

## THOMAS FLEXIBLE COUPLING COMPANY

Largest Exclusive Coupling Manufacturer in the World  
WARREN, PENNSYLVANIA, U.S.A.

## Forming:

### N. E. Steel Co. gets 400-ton press

Worcester Pressed Steel Co. has added to its facilities a 400 ton blanking, forming, and multiple operations press of a type rarely used outside the automotive industry. The press has one of the largest bed areas in New England.

The 105,000 lb giant was built to company specifications so as to provide handling versatility for a wide variety of stampings. Standing



Press has one of the largest beds in New England.

more than 20 ft high, press has a bed area for inserting dies up to 42 in. in width by seven ft in length.

It is equipped to blank large sheets of metal at the rate of 1200 strokes an hr and to form large pieces such as architectural panels. Eight sets of drawing tools can be set on the bed side by side for drawing heavy parts up to eight in. in depth. Three separate pressure pads permit operator to vary the depths of the draw and complete up to 600 parts an hr.

'dag' dispersions... a touch does so much!



## Tool-life increased 60 times

In an unusual multiple-spindle drilling operation, a machine-tool firm found that straight cutting-oil did not give satisfactory performance. Drills constantly had to be resharpened after sinking about 50 holes.

However, when a 1:300 dilution of a 'dag' dispersion of colloidal molybdenum disulfide in oil was tried, tool life before resharpening was extended to 3,000 holes!

This result is typical of the production improvements which can be realized through the use of this outstanding new high-pressure lubricant. Whatever your machining operation, it is likely that molybdenum disulfide can help. And Acheson Colloids' service engineers can give you the benefit of their experience in its application. Why not get in touch with your nearby Acheson representative? Meanwhile, write for your free copy of Bulletin No. 424.



### ACHESON COLLOIDS COMPANY

PORT HURON, MICHIGAN

... also Acheson Colloids Ltd., London, England

ACHESON COLLOIDAL DISPERSIONS:

Graphite • Molybdenum Disulfide • Zinc Oxide  
Mica and other solids

'dag' is a registered trademark of Acheson Industries, Inc.

**Acheson Colloids Company, Dept. D-7  
Port Huron, Michigan**

Yes, I want to get your free catalog on 'dag' dispersions for use in Industrial Lubricants.

Name

Title

Company

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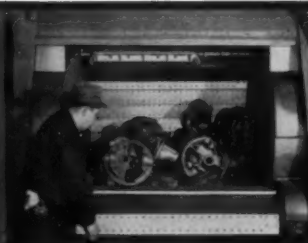
# YOU CAN WITH A if you

**IF** your performance results do not measure up to these SUPER SAVINGS it will pay you to investigate the WHEELABRATOR SUPER TUMBLAST

**DAYTON MALLEABLE  
IRON CO.**

(Ironton Div.)

Ironton, Ohio



*Saves* **CLEANING  
TIME**

Cleans toughest work faster than 2-wheel machine.



*Saves* **WEARABLES**

Over 530 hours on one set of blades.



*Saves* **ABRASIVE**

No abrasive gets out of the machine. The door stays tight.



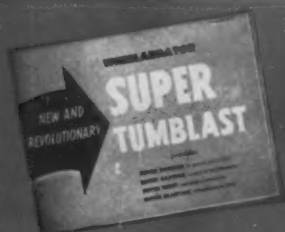
*Saves* **MAINTENANCE**

"This machine is designed for the maintenance man", says the maintenance foreman.



*Saves* **MAN HOURS**

Automated operation relieves operator for other duties.



Write today for your free copy of this 12-page, fully illustrated brochure. Ask for Catalog No. 125-B.

**WORLD'S LARGEST MANUFACTURERS  
OF AIRLESS BLAST CLEANING EQUIPMENT  
AND STEEL ABRASIVES**



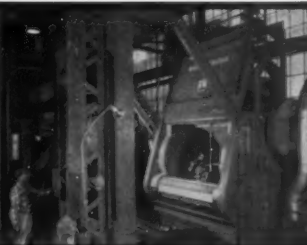
# **SAVE MONEY**

## **WHEELABRATOR® SUPER TUMBLAST**

**operate batch-type cleaning equipment**

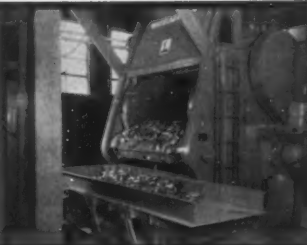
**UNITCAST CORP.**

Toledo, Ohio



**INDIANA FORGE  
& MACHINE CO.**

East Chicago, Ind.



Cleans deep core work as fast or faster than 2-wheel machine.

Cleans twice the volume in half the time formerly required in smaller machines.

Over 1,000 tons cleaned and liners are just getting polished.

Not a single wearable part has been replaced in over 8 weeks of operation.

The separator removes sand and scale and keeps all abrasive in the machine.

68% reduction in abrasive costs, using Wheelabrator Steel Shot.

"Lowest maintenance blast equipment in our shop".

Maintenance negligible.

Trouble-free operation eliminates downtime.

No direct labor. Trucker operates machine.

# **WHEELABRATOR**

510 S. Byrkit Street

CORPORATION

Mishawaka, Indiana

## NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 93 or 94.

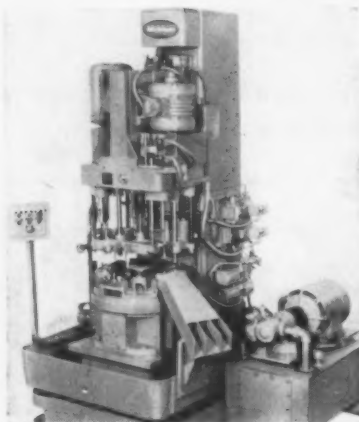


### Heavy duty fork truck works in six ft aisles

Without sacrificing stability or ruggedness, a new heavy-duty fork lift truck can carry and stack in aisles as narrow as six ft. The battery powered truck utilizes company's unique side loading principle, so that it does not have to turn to face its load. Thus the required aisle width is fixed by the width, not the length, of truck and load. With a capacity of 4000 lb, it has speed, stability, battery capacity, operational ease, and other features equal or superior to those of a conventional electric fork truck of the same capacity, the maker says. Truck is of the standup rider type. With full size wheels, automotive

type steering, and hydraulic brakes, it provides operator comfort and convenience. Other specifications: 130 in. maximum lift, 31 fpm loaded lift speed, parking brake with pedal interlock, five degree tilt forward and back, free lift of 67½ in., and a compartment for standard batteries up to and including 25.20 kw-hr. For in-plant delivery and pallet rack operations it is said to permit substantial saving of aisle space. It can perform in-plant deliveries not practical with conventional trucks, such as delivery of bar stock to machine tools. *Baker-Raulang Co.*

For more data circle No. 28 on postcard, p. 93

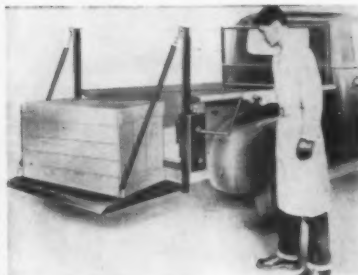


### Little "giant" is built for automation field

Described as the company's "latest contribution in the field of automation," this machine is designed to drill, chamfer and tap a 5/8-18 hole in a flange nut. It performs these operations on 750 flange nuts per hour, and ejects the complete parts into the chutes. It is built to J.I.C. hydraulic and electrical standards. In addition, it has automatic lubrication throughout. A self contained coolant tank is built into machine's base. This was designed for easy accessibility and features an outside clean-out. The entire machine

has been engineered and built using standard components. It has a standard Hydro No. 3 vertical unit with a six spindle combination drill and individual lead screw tapping head. It has a 20 in., five station, two place fixture with power clamping and an automatic eject. Says the company of the machine: "This little production giant clearly demonstrates the engineering know-how and the uncanny skill of our engineers. . . ." *Michigan Drill Head Co.*

For more data circle No. 29 on postcard, p. 93



### Small trucks can now have own tailgate lift

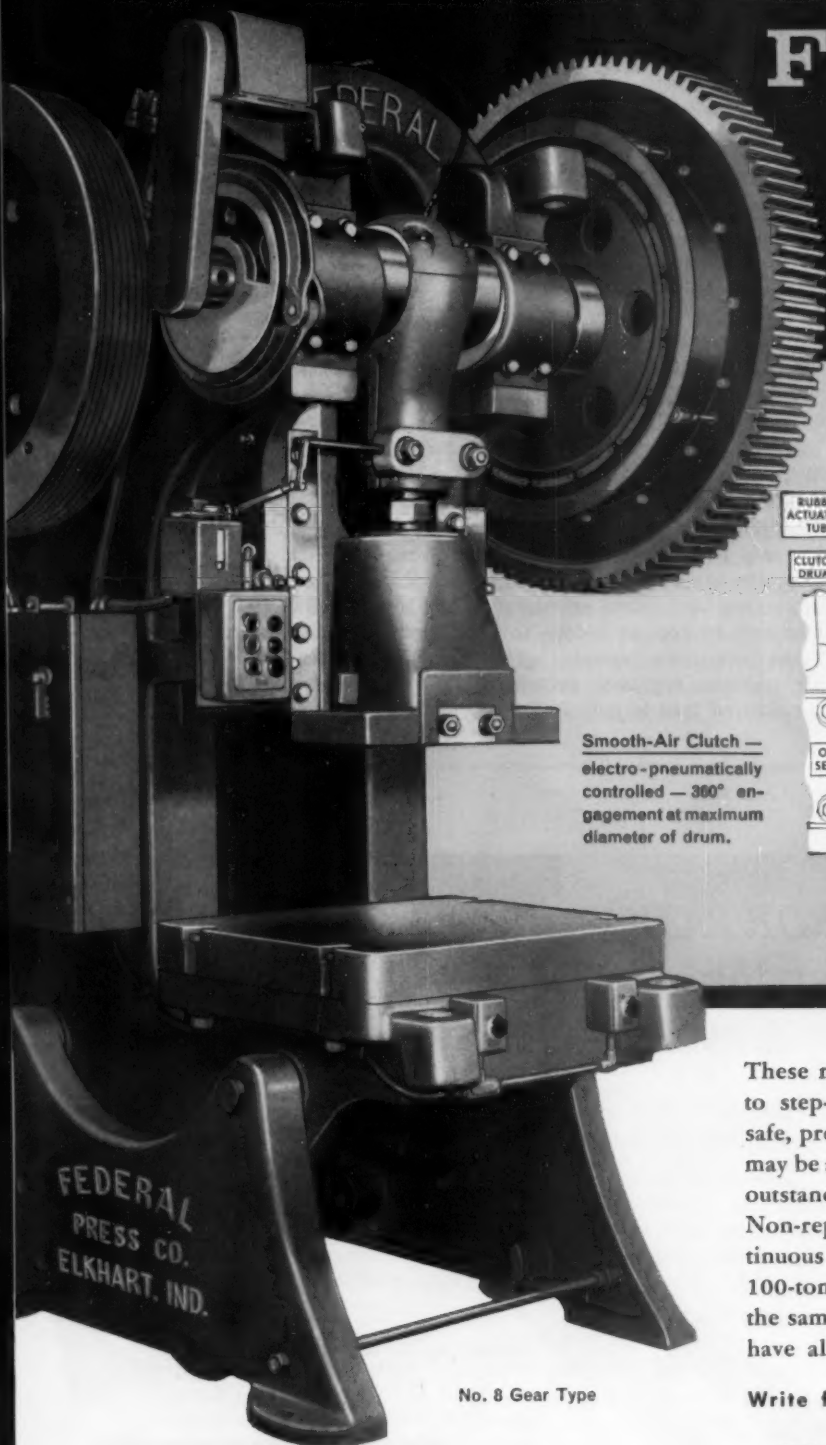
For use with pickup and express truck bodies, a new hand operated elevating tailgate lift is said to bring to small truck users the same advantages enjoyed by the heavier trucking field but at lower cost. The lift is a completely packaged kit, ready to install in less than two hours. Anyone, maker claims, can

assemble the lift by simply using six bolts. The unit weighs only 175 lb. This presumably keeps the truck within its present license fee. It has a capacity of 600 lb. It contains a simple mechanism with ball bearings throughout. *Mid West Body & Mfg.*

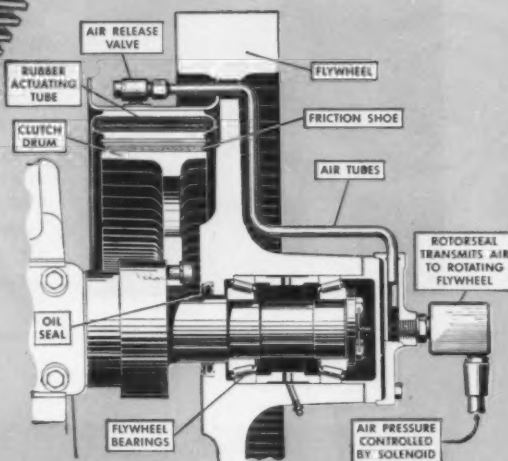
For more data circle No. 30 on postcard, p. 93

Now you can **PRODUCE FASTER  
FOR LESS**

with this 100-ton  
**FEDERAL**  
air-clutch press



**Smooth-Air Clutch —**  
electro-pneumatically  
controlled — 360° en-  
gagement at maximum  
diameter of drum.



These modern Federal Presses have what it takes to step-up production and cut unit costs! Their safe, precision, fatigue-free operation *at high speeds* may be attributed to the fast-acting clutch plus other outstanding features. Dual-solenoid safety valve. Non-repeat mechanism. "Inching" control. Continuous as well as single-cycle operation. In 6.6 to 100-ton capacities, these rugged presses embody the same superior materials and workmanship that have always distinguished Federal's construction.

Write for new catalog showing complete line.

**FEDERAL PRESS COMPANY**

602 Division Street, Elkhart, Indiana

**FEDERAL** *Open back  
Inclinable* **PRESSES**

31 Years of Quality Construction

## NEW EQUIPMENT



### Railroad shunter puts shoulder to the job and pushes

The push rod of this single-wheel railroad car shunter acts on the railroad car much like a man pressing his shoulder against it to push it forward. It works as an additional—but driven wheel, clamped to the car with a push rod. Though the maker is conservative in emphasizing that this is not intended to replace a switching locomotive,

its six hp, air-cooled, single cylinder, two-stroke motor will provide the frictional pressure required between the driving wheel and the rail to move the car forward. Maker says a complete stock of parts are on hand in the U. S. and Canada. *Railroad Car Shunter Corp. of America.*

For more data circle No. 31 on postcard, p. 93



### Hardness testers reported having undergone change

Long thought to be standard, stock machines, one firm's hardness testers have undergone a change. With the new air-operated, semi-automatic tester, standard loads of 500, 1000, 1500, 2000 and 3000 kg are said to be assured, because the accurate gage mounted at the top of the machine shows exactly what load will be applied before test is made. Operator simply adjusts air pressure regulator valve until the desired load is indicated. Once

set, any number of hardness tests can be made in rapid sequence. Load is applied by pulling out plunger-type control valve and released instantly by pushing it in. Machine need only be attached to a standard compressed air supply. Fluctuations in air supply pressure above 65 psi will not affect accuracy, maker says. Compactness and accuracy is reported. *Tinius Olsen Testing Mach. Co.*

For more data circle No. 32 on postcard, p. 93

*Here is an IMPORTANT  
conveyor message for the  
metalworking industry*



Write today for complete information.



**MAY-FRAN**

ENGINEERING, INC.

1698 Clarkstone Road Cleveland 12, Ohio



### Pin type arbor precision machines gears

Precision machining of gears with involute splined bores is said to speed production by way of loading, locking and unloading pieceparts. No arbor press is required to press gear on and off arbor, and no nuts or wrenches are needed for locking piecepart on arbor. Improved quality of finished gears is possible because arbor eliminates pitch line runout in subsequent gear cutting operations. Also, gear blank face and sides will run square and true

due to powerful precision hold generated by arbor pins. Operation is said to be extremely simple. Piecepart is loaded and operator rotates it to actuate arbor. This moves pins up internal cams which force them into line contact with adjacent splines at, or near, pitch line. Part is locked firmly as pins apply equal force around plined bore. Thrusts from operations keep piece tight.

*Scully-Jones and Co.*

For more data circle No. 33 on postcard, p. 93



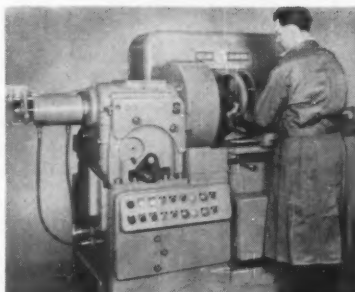
### Improved gear shaver features semi-automatic loader

An improved internal shaver featuring a semi-automatic loader is available. It avoids former hand loading and cutter mashing procedures in shaving internal spur and helical gears from three to 12 in. pitch diam having teeth up to four diametral pitch and tooth face widths up to 2½ in. Operator merely hangs gear on shaving cutter,

presses a button, and removes gear from workhead after shaving. When gear is on cutter a locator positions gear in correct location. After cycle and safety start buttons are pressed simultaneously, cutter head advances and part pivots into holder. Part is then clamped and shaved.

*National Broach & Mach. Co.*

For more data circle No. 34 on postcard, p. 93



### NOW YOU CAN ASSEMBLE YOUR OWN "CUSTOMIZED" CONVEYORS FROM PRE-FABRICATED STANDARD SECTIONS.

If your plant produces stampings, formed metal parts, castings or forgings . . . if you have a byproduct such as automotive scrap, chips and turnings . . . the MAY-FRAN conveyor standardization program will provide your company with savings never before possible.

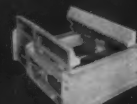
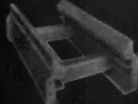
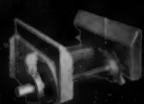
Through standardization, MAY-FRAN now makes it possible to assemble individual components into virtually any type of conveyor to handle a wide range of products or materials. Straight sections . . . concave or convex sections . . . take-up charge sections and discharge-end sections can be furnished to meet specific requirements of belt width as well as load bearing and volume capacities.

Even after they are installed, MAY-FRAN conveyors

can be dis-assembled and re-assembled in other plant locations . . . to handle other products. Standardized conveyors can be lengthened, shortened or modified in almost any way . . . and at minimum cost.

Pre-fabricated conveyor sections can be furnished rapidly and inexpensively. The individual components provide users with the ultimate in flexibility. MAY-FRAN hinged-steel conveyor belting is used on the Standardized units. Belting is available in widths from 6 inches to 6 feet in any length. Solid and perforated links are available in pitch lengths from 2½ to 9 inches.

MAY-FRAN . . . a name long recognized in the materials handling field . . . is first again with standardized components for your customized installations.



## SERIES HB —

# The High Quality Heavy Duty EUCLID HOISTS

These hoists are highly efficient and strictly modern in every detail with oversize anti-friction bearings and heat treated steel parts in combination with a welded frame.

The planetary gearing and mechanical load brake are mounted in oil tight housings. The hoist gearing is assembled in the hoist drum.

This design produces an unusually compact, rugged and accessible hoist readily adapted to various installations and types of control.



Low headroom cross-mounted plain trolley hoist.



Parallel mounted hoist with cone trolley drive.

Write for the HB Hoist literature illustrating and describing the many features.

**THE EUCLID CRANE & HOIST COMPANY**

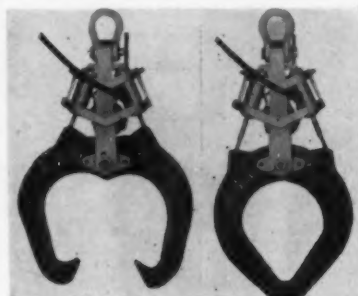
1361 CHARDON ROAD, CLEVELAND, OHIO



## NEW EQUIPMENT

### Lifting hook

A new patented lifting hook, now being used to speed up heavy lifting chores in industry, such as handling hot ladles in foundries, has been announced. The pneumatically operated and electrically controlled



hook can be operated by pushbutton from the cab of a crane. It is made in two sizes, 6- to 12-ton capacities, and is all welded and reinforced. Although its jaws open wide for easy pickup, they overlap in closing and cannot open under any load condition, maker says. *Gar-Bro Mfg. Co.*

For more data circle No. 35 on postcard, p. 93

*the growing trend  
in tooling*

**RED METALS CO. SEAL**

**ALUMINUM  
TOOLING PLATE**

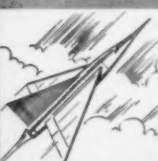
Many industries are profiting from the outstanding advantages of machinability, low cost, lightweight and corrosion resistance made possible by Red Seal Aluminum Tooling Plate and Bar Stock.



**INVESTIGATE ...** The advantages of low cost Red Seal Plates and Bars for your tooling requirements. Call or write for this new Red Seal Aluminum Products Brochure.

**EASTERN DISTRIBUTOR:**  
Aluminum Division of  
Atlantic Steel and Iron Co.  
Page Boulevard, Springfield, Mass.  
Phone: 9-9611

#### AVIATION



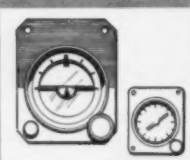
#### AUTOMOTIVE



#### PHOTOGRAPHY



#### INSTRUMENTS



#### COMMUNICATIONS



#### NUCLEONICS



**RED SEAL METALS CO.**

10035 Burtis Street, Dept. B  
South Gate, Calif., LOrain 6-5105

### Open end ratchet wrench

This open end roller ratchet wrench, is said to grip tighter than ordinary end wrenches and faster than box wrenches. It is designed for use with the two most widely used sizes of tube fittings— $\frac{1}{4}$  and  $\frac{3}{8}$  in. Made from tool steel, heat-treated and heavily-plated, the wrench



automatically equalizes torque over five corners of hexagon nut, thus increasing strength and insuring sure grip. Rollers are made of special alloy steel. Wrench is recommended for tube fittings in close quarters and tight places where the degree of swing is limited. *Crawford Fitting Co.*

For more data circle No. 36 on postcard, p. 93

### Power sweeper

Powered electrically a new type of power sweeper has a 3-speed transmission forward, plus one in reverse. It operates with two motors. One is for travel and one for power to brushes and vacuum. This prevents drain on the batteries when



sweeper is merely travelling to or from a job, and makes it possible for the sweeper to operate a normal 8-hour day without recharging. The sweeper is capable of sweeping up to 70,000 sq ft per hr in open areas. Transmission provides gear ratios for every sweeping condition, even steep grades. Wayne Mfg. Co.

For more data circle No. 37 on postcard, p. 93

### Self-locking screw

Self-locking screw has nylon self-locking inserts. These consist of a nylon pellet installed in the threaded portion of a screw. It is an optional feature of company's line of



standard, special and aircraft socket screw products. The insert eliminates the need for other locking devices such as lock-washers, adhesives and wired heads. *Standard Pressed Steel Co.*

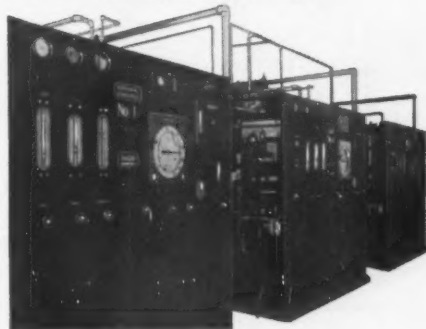
For more data circle No. 38 on postcard, p. 93

## For Fully Automatic, High Purity, Safe, Economical Furnace Brazing and Bright Annealing of Stainless Steel

### Nitroneal Gas Generator

- NO OPERATING PERSONNEL REQUIRED
- COMPLETELY OXYGEN-FREE
- NO EXPLOSION HAZARD
- 30% CHEAPER THAN DISSOCIATED AMMONIA

Write for FREE, informative booklet No. 21 and technical assistance.



Pure nitrogen with controllable hydrogen content that can be varied to meet changing requirements and maintained between .25% and 25% is provided, at low cost, by the Nitroneal Gas Generator for use as material or for processing. Applications include: bright annealing, heat treating and furnace brazing of stainless steel, low and high carbon steels and non-ferrous metals.

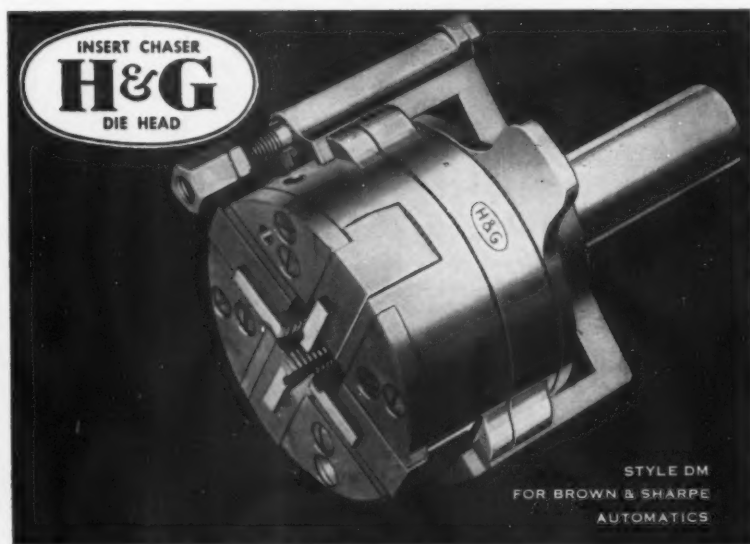
**BAKER**  
& COMPANY, INC.

**PRECIOUS  
METALS**

113 Astor St., Newark 5, N. J.

NEW YORK • SAN FRANCISCO  
LOS ANGELES • CHICAGO

ENGELHARD INDUSTRIES



STYLE AND SIZES FOR ALL MACHINES ON WHICH THREADS ARE CUT

## On Brown and Sharpe, and other automatics

### INSERT CHASERS SAVE UP TO 33%

Insert chasers are like safety razor blades: they cost so little that you can throw them away when dull. Or, for utmost economy, you can resharpen them over and over again. Only a flash grind is required. For less than \$40 you get a dozen sets of  $\frac{1}{16}$ -16 insert chasers, each set ground ready to go. You will be amazed at the quantity of threads they will cut, even to Class 3 specifications, with a minimum of downtime. FREE: "Selecting the Proper Die Head for the Job".

THE EASTERN MACHINE SCREW CORPORATION

21-41 Barclay St., New Haven, Conn.

## When the bases are loaded...

... and the pressure is on, for delivery of metal stampings — WSM facilities are ready to help you in the emergency.

Skilled workers . . . over 100 presses from 40 to 1,000 tons capacity will produce workable metals into light, heavy and deep drawn stampings — to exact specifications.

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for quotations.

**WORCESTER STAMPED METAL**

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SPECIALISTS IN SKILLED STAMPING SERVICE

## PRICE LIST

### ON HANNIFIN STOCK HYDRAULIC PRESSES

1-TON .....	\$ 552
2-TON .....	\$ 627
5-TON .....	\$1,306
8-TON .....	\$1,356
10-TON .....	\$1,855
25-TON .....	\$3,401

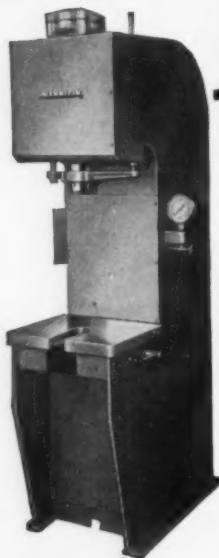
Prices complete with motors and starters F.O.B. our  
press plant, St. Marys, Ohio, subject to change without notice.

#### DELIVERY FROM STOCK

Demand for these popular presses is so consistent we are able to produce them in quantity and pass the savings along to you.

Construction-wise and quality-wise these small general-purpose presses are identical to the larger Hannifin presses, up to 150 tons. Special, optional controls when needed.

WRITE for complete information on the Hannifin Hydraulic Press you're interested in.



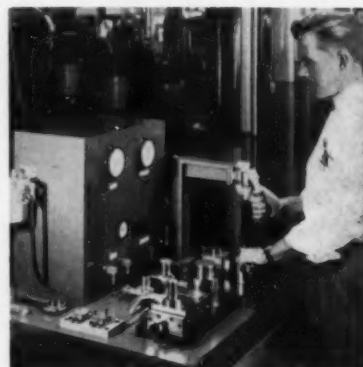
# HANNIFIN

HANNIFIN CORPORATION, 513 S. WOLF ROAD, DES PLAINES, ILLINOIS

## NEW EQUIPMENT

### Two-station air gage

This air gage checks three different sizes of connecting rods. Gage measures parallelism in one plane of crankshaft and wrist-pin bores and squareness of the connecting-rod face to the crankshaft bore. The first station is equipped with two sets of interchangeable air plugs. One set is for three sizes of crankshaft bores, the second for three



sizes of wrist-pin bores. Crankshaft-bore plugs are interchangeable at the fixed position of the station. Plugs for the wrist-pin bore are mounted on a spring-loaded slide with three mounting positions, according to length of the connecting rod. Each plug has two air jets, 0.400 in. apart, with one directly above the other on the outside of the plug. *Federal Products Corp.*

For more data circle No. 39 on postcard, p. 93

### Draw press

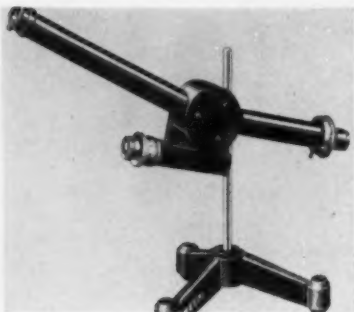
A new welded-steel, under-drive mechanical draw press features an operating mechanism in the press bed for easy inspection and maintenance out of the way of production. In addition, it has swivel arrangement of counterbalance cylinders which permits them to align properly when the gibs are adjusted. A double lube system provides both automatic and gravity flow lubrication to all bearings. Presses are available in sizes from 500 to 1000 ton capacity with beds from 74 x 72 in. to 200 x 100 in. Press may have a fast advance and return, and still maintain a safe drawing speed. *Baldwin-Lima-Hamilton Corp.*

For more data circle No. 40 on postcard, p. 93



## Spectrometer

Spectrometer reads wavelengths direct in Angstroms on a graduated drum to 1A. Accurate readings can be made quickly by aligning the same bands of two readily visible reversed spectra. Instrument forms two spectra alongside each other, with the direction of their colors reversed. The spectra move across

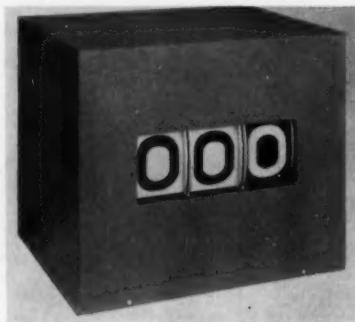


the field in opposite directions with the turn of a micrometer screw. Readings are obtained by setting the line in one spectrum against the same line in the second spectrum. Immediate readings in Angstrom units to 1A, are made on the drum which is graduated from 3,000 to 7,000 A. *The Ealing Corp.*

For more data circle No. 41 on postcard, p. 93

## Down time recorder

A down time recorder is said to perfectly register, to the second, when any production machine is down, no matter what the reason. Plugs in anywhere—and automati-



cally resets itself. The 6 in. letters are visible from up to 200 ft. All-enclosed, fully sealed. Accurate, trouble-proof and fool proof, it prevents non-productiveness and costly delays. *Down-Time Recorders, Inc.*

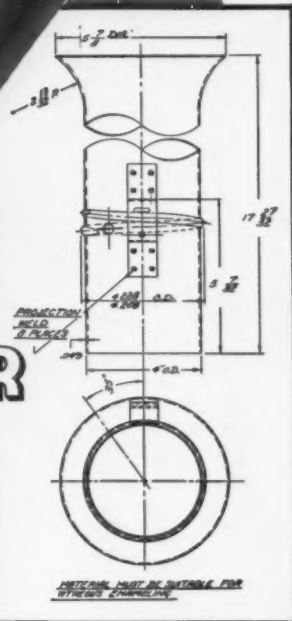
For more data circle No. 42 on postcard, p. 93

# Michigan Electric Resistance WELDED STEEL TUBING

Always makes possible Better  
products at lower Cost

## CONDENSER TUBE

for  
WASHER  
-DRYER



## ROUND

SQUARE	Gauge	RECTANGULAR
1/4 to 1/2	16 thru 22	1/4 minimum
1/2 to 1	11 thru 22	side to 5
1 to 2	11 thru 20	maximum side
2 to 3	11 thru 18	

Carbon 1010 to 1025

## Michigan Tubing

has uniform strength, weight, ductility, I.D. and O.D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, bonded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

A prominent component of a new combination washer-dryer now on the market is this condenser tube fabricated by Michigan.

In the manufacture of this important tubular part, which helped make possible a major forward step in the development of an appliance for better living, Michigan engineers were required to solve a difficult production problem. The utmost design skill and fabrication accuracy were essential.

Refer to the drawing and note the expansion required for this part and the spiral bead—operations commonly and efficiently performed with Michigan's modern fabricating equipment. The bracket is projection welded to the tube in a single high production operation—another typical example why Michigan engineers and production workers cannot be excelled in the quantity manufacture of intricate tubular products at low cost.

Always consult Michigan first on any special tubular job requiring the greatest accuracy of product and economy of manufacture.

# Michigan STEEL TUBE PRODUCTS CO.

40 Years in the Business

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FACTORIES: DETROIT, MICHIGAN • SHILBY, OHIO

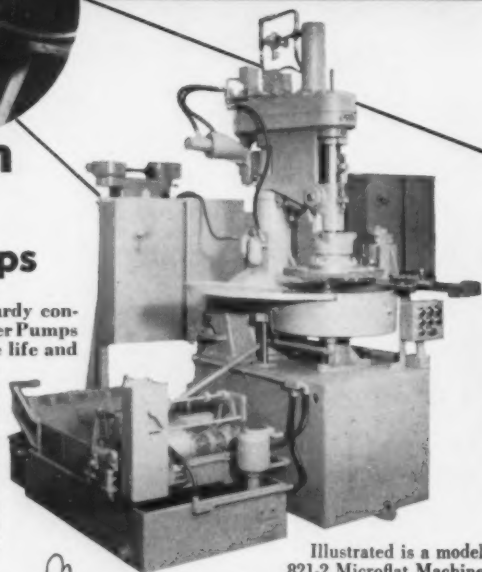
DISTRIBUTORS: Steel Sales Corp., Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—Service Steel Div., Van Pelt Corp., Los Angeles, Calif.—Donald A. Harston, Cleveland, Ohio—Globe Supply Co., Denver, Colo.—W. A. McMichaels Co., Upper Darby, Pa.—William F. Hall & Associates, Dayton, Ohio—John Emery West, Miami, Florida—Gary A. Osborne, Buffalo, N. Y.—Earle M. Jorgensen Co., Houston, Texas



**Designed to do  
a better job**

## **R**uthman Gusher Coolant Pumps

The simple designs and sturdy construction of Ruthman Gusher Pumps assure you long trouble-free life and efficient operation. There are fewer parts to wear, pre-lubricated heavy-duty ball bearings require no further lubrication — electronically balanced rotating assembly cuts vibration to minimum. So be sure to specify the pumps that are designed to do a better job . . . "Gusher" Pumps.



Illustrated is a model 821-2 Microflat Machine equipped with a "Gusher" Coolant Pump—Photo courtesy of Micromatic Hone Corp. CINCINNATI 2, OHIO

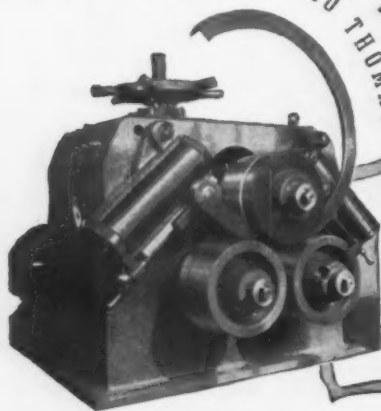
**THE RUTHMAN MACHINERY CO.**

1809-1823 READING RD.

THE TREND IS TO THOMAS

**For**

**ANGLE-BENDING**



**IT'S A "MUST" FOR  
PRODUCTION  
BENDING**

**I**f your production calls for circles or segments from angles, flats, rounds or other shapes in quantities, the THOMAS ANGLE BENDER may be the solution to your need for greater production at less cost!

### **BULLETIN 314**

describes the four sizes and is yours for the asking. Write for it now!

**THOMAS**  
MACHINE MANUFACTURING CO.

PITTSBURGH 23, PA.

**PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES**

## **NEW EQUIPMENT**

### **Self reading tape**

A unique extension tape rule that permits instantaneous readings right from a dial is now available. Self-reading rule shows complete measurements to fractions of an in., clearly read on a vernier dial, with a reasonable degree of accuracy. Upper graduations on dial show 1/16 in. fractions with main frac-



tions on lower side. The triple coated white-face tape is counter-balanced with an inner return spring for smooth operation. Oiling and cleaning pads are built in to clean and oil the tape rule blade each time it is used. *Frederick Post Co.*

For more data circle No. 43 on postcard, p. 93

### **Solid tantalum capacitors**

Solid Tantalum Capacitors contain no liquid electrolyte. Made with a true hermetic seal, the capacitor eliminates altitude and humidity problems. It is intended primarily for low voltage transistor circuits for which it is ideally suited. Ca-



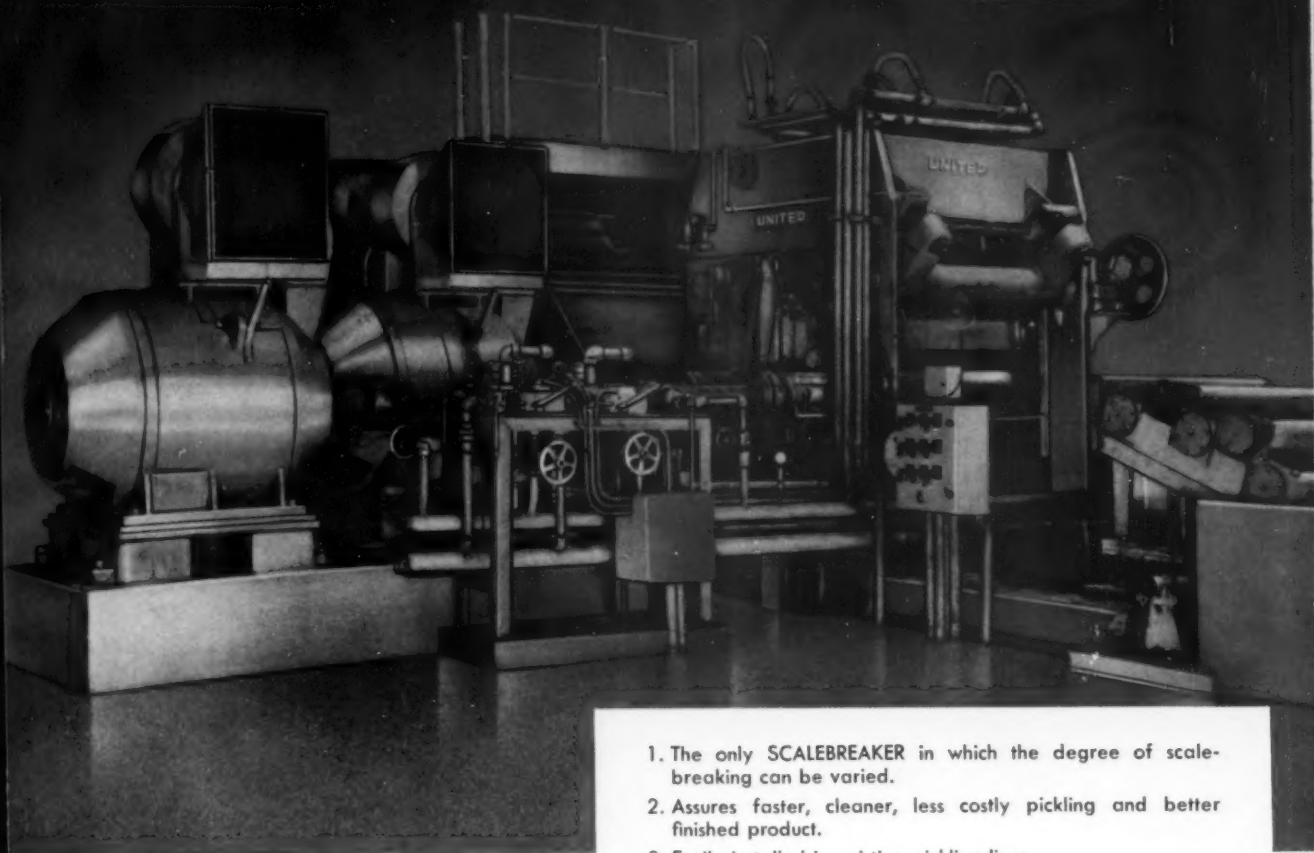
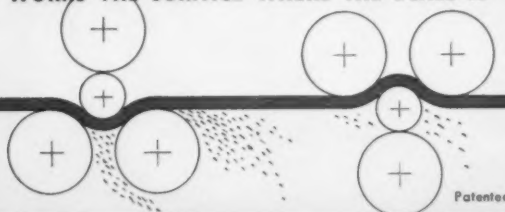
pacitors are made in three standard sizes, with 24 standard ratings. The capacitor assembly is potted and hermetically sealed in a metal case, assuring resistance to thermal and mechanical shock. *Rectofer-Capacitor Div., Fansteel Metallurgical Corp.*

For more data circle No. 44 on postcard, p. 93

# UNITED®

## NEW *Strip Processing* SCALEBREAKER

"WORKS THE SURFACE WHERE THE SCALE IS"



1. The only SCALEBREAKER in which the degree of scale-breaking can be varied.
2. Assures faster, cleaner, less costly pickling and better finished product.
3. Easily installed in existing pickling lines.

Write today for complete engineering data.

# UNITED

## ENGINEERING AND FOUNDRY COMPANY

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Plants at: Pittsburgh • Vandergrift • Youngstown • Canton • Wilmington (Lobdell United Division)

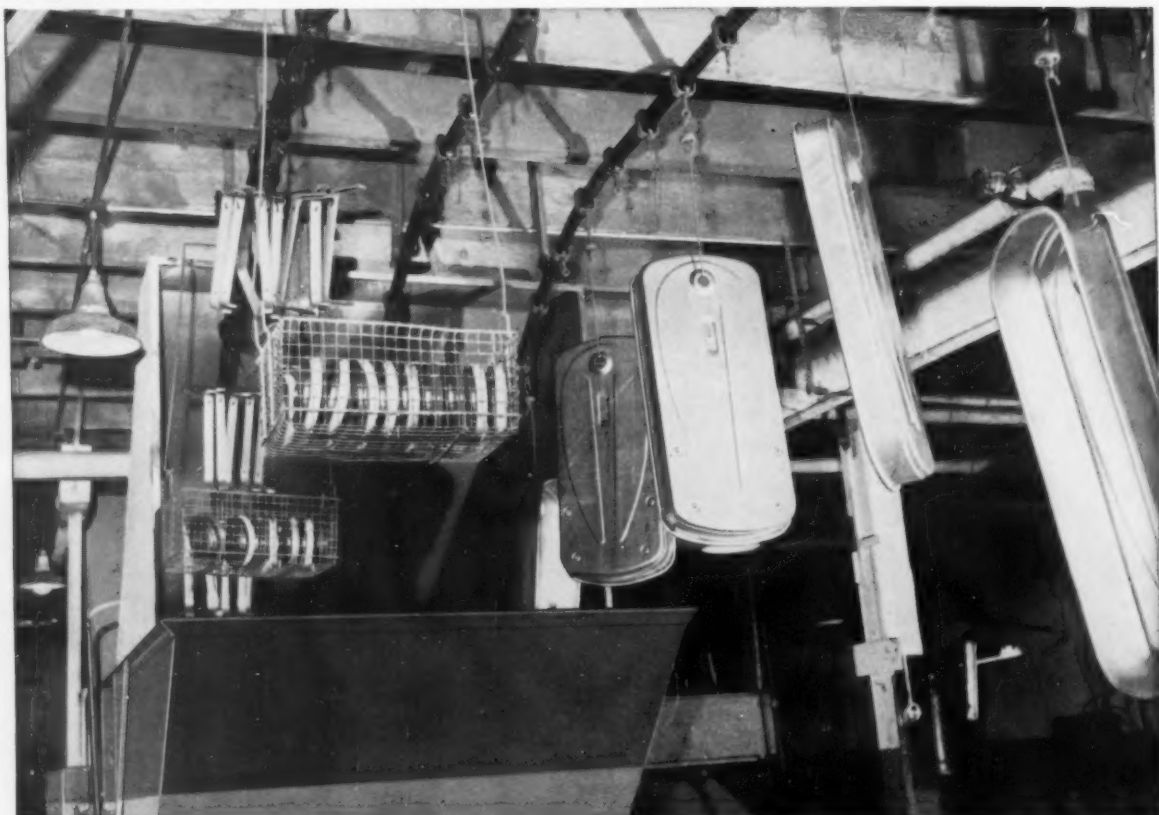


Subsidiaries: Adamson United Company, Akron, Ohio  
Stedman Foundry and Machine Company, Inc.,  
Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling  
Mills, Mill Rolls, Auxiliary Mill and Processing Equipment,  
Presses and other heavy machinery. Manufacturers of Iron,  
Nodular Iron and Steel Castings and Weldments.



Dow . . . industry's most complete line of chlorinated solvents



Higher boiling point of DOW PERCHLOROETHYLENE gives parts longer, more thorough cleaning action before parts' temperatures reach that of the vapor. This is a particular saving when tough contaminants like waxes and buffing compounds are being removed.

It's a smooth, no-repeat operation  
when you're running on highly stable

## DOW PERCHLOROETHYLENE

Continuous monorail or cross rod conveyor units need an exceptionally stable solvent to deliver "one stop" vapor degreasing. The major value of these high-speed units is lost if improper solvent fails to degrease parts thoroughly, forcing reruns.

High-boiling DOW PERCHLOROETHYLENE answers this problem with stability to spare. You can't find a solvent with greater resistance to thermal breakdown or deterioration from light and oxygen. This stability *plus* prevents decomposition of DOW PERCHLOROETHYLENE that would harm the units or the

load. And this solvent's greater vapor density holds vapor loss far lower.

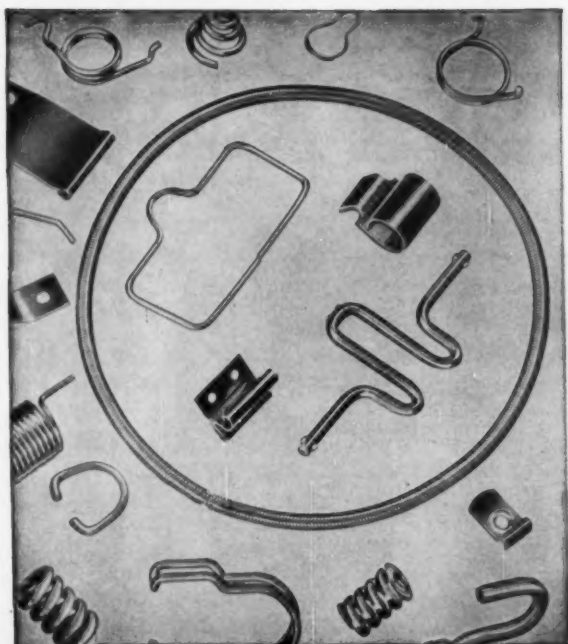
Contact your local Dow distributor *today* for a profitable fill-in on how you could use this efficient, safe vapor degreasing solvent. You'll want to ask him about "work horse" DOW TRICHLOROETHYLENE, METHYLENE CHLORIDE and sensational, cold-cleaning CHLOROTHENE\*, too. For detailed technical information on any of these solvents, just drop a line to THE DOW CHEMICAL COMPANY, Dept. S942A-1, Midland, Michigan.

\*Trademark of The Dow Chemical Company

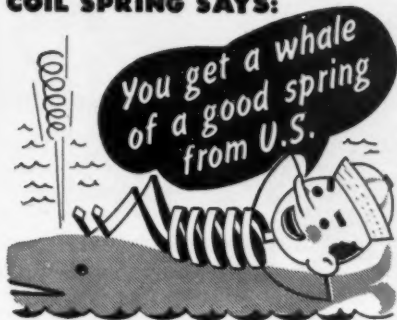
you can depend on DOW CHEMICALS







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From the minute we get the word that you're interested in springs, we're at your service! Our skilled workmanship and modern production facilities insure that your products incorporating U. S. Steel Wire springs will perform according to your specifications. We also make wire forms and small parts. Call us today.

*No order too large or too small!*

**The U. S. STEEL WIRE SPRING Co.**

7800 FINNEY AVE. • MICHIGAN 1-6315

CLEVELAND 5, OHIO

July 12, 1956



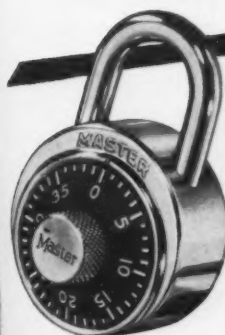
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**for every  
industrial  
use!**



#### FAMOUS MASTER LAMINATED PADLOCKS

Multiple steel plates . . .  
stronger than a solid  
block! Genuine brass-  
cylinder, pin-tumbler  
security. No finer  
padlock protection!



#### STAINLESS STEEL COMBINATION PADLOCKS

Double-wall construc-  
tion . . . 3 number  
brass locking me-  
chanism. Available  
with "Key-Control"  
— one control key  
opens all locks.



LOCKERS

Typical  
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POWER PLANTS



TRUCKS

Master's complete line offers you the world's finest padlock security . . . for every protection need!

Here are just a few of the Master features and services that make your protection problems easier:

- Special long or short shackle styles.
- Steel or brass cases.
- Quick delivery on keyed alike or master-keyed sets.
- Chain fittings for all styles.

Available from your Industrial Supply or Hardware wholesaler.

Write for FREE  
Catalog of complete  
Master line . . .

**Master Padlocks**

Master Lock Company, Milwaukee 45, Wis.  
World's Largest Padlock Manufacturers



## A MILE OF BLOOD VESSELS FOR A ROBOT

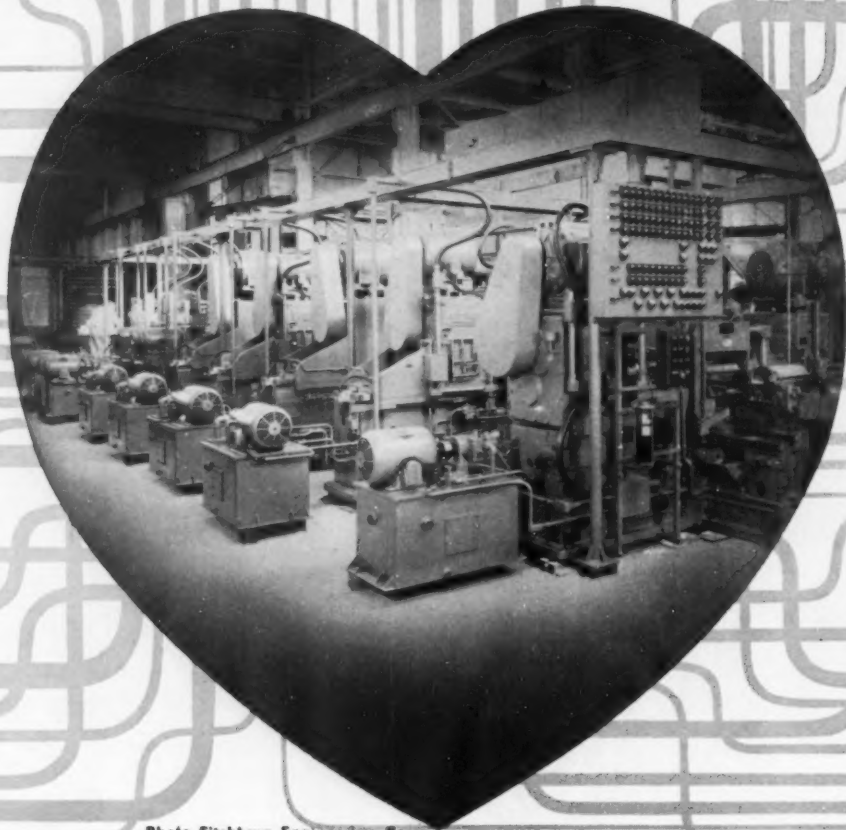


Photo Fitchburg Engineering Corp.,  
Fitchburg, Mass.

This mechanical giant was designed and built by Fitchburg Engineering Corporation. It is a 23-station transfer machine for milling, boring, drilling and reaming automatic transmission cases for new cars. Its "blood vessels" are many sizes of low carbon steel SAE hydraulic tubing by Superior, carrying pressures up to 1000 psi throughout the system. The breakdown of just one "blood vessel" could stop not only the machine but the entire production line—a very costly mischance. Superior tubing was chosen because it provides a dependable, leakproof hydraulic system.

Superior specializes in seamless low carbon steel tubing for all hydraulic purposes. Some sizes can bear working pressures up to 12,000 psi. The steel has a maximum carbon content of only

.12%, which results in high ductility, permitting easy hand bending and flaring. This non-aging steel holds its ductility and impact resistance during storage and/or use.

All Superior hydraulic tubing is 100% hydrostatically tested at maximum working pressures. Constant quality control during production assures clean, smooth inside surfaces that minimize pressure drop due to back pressure from internal friction.

If you have hydraulic tubing problems, let Superior's tubemanship and years of industry-wide experience help solve them for you. Write Superior Tube Company, 2004 Germantown Ave., Norristown, Pa., for Bulletin No. 39 giving additional technical data on hydraulic tubing.

# Superior Tube

The big name in small tubing  
NORRISTOWN, PA.

*All analyses available in .010 in. to ¾ in. OD—certain analyses in light walls up to 2½ in. OD*

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. • RAYmond 3-1331

## The Iron Age SUMMARY...

**Big blowup coming if steel strike continues through this week . . . Washington worried over talk of six-to-eight-week strike . . . Strike's impact will last through the year.**

**Blowup Coming . . .** A real blowup is in the cards should the steel strike continue through this week without definite prospects of an early settlement. Despite the apparent quiet, there's plenty going on behind the scenes. Pressure is building up on both sides to the dispute.

The Administration is plainly worried by talk of a six- or eight-week strike. Washington moves have been more or less tentative and to-be-expected, thus far. But another week of "no progress" will bring some stiff injunctions from high Administration people for both sides of the dispute to get on the ball.

With an important election coming up, the Administration has no intention of letting the strike drag on too long. Washington observers figure six weeks is the absolute limit. And strong pressure will be brought to bear long before then.

**Lasting Effects . . .** Best guess is that the steel labor talks will shift to Washington should preliminary efforts to bring both sides together meantime fail to smoke out a compromise agreement.

But even a quick settlement is bound to leave

some consumers in the lurch. Those dependent on plates and structurals already see the handwriting on the wall despite "comfortable" stocks in the hands of a few. Metalworking generally will feel the effects through balance of the year.

Reason for this is that it would take the mills at least a week to bring production back to where it was before the strike. And mill order books and production schedules will be snafued for months after a settlement.

By end of this week, strike losses will have mounted to 4.5 million ingot tons.

**Post-strike Outlook . . .** Regardless of how soon or late the walkout ends, here is the post-strike outlook for steel consumers, big and small:

Virtually all products will be hard to obtain. Premium-price markets will be long-lived. Conversion will come back into the picture, particularly in plates and structurals. Flat-rolled products will be hard to get by September.

The Government's freeze on certain steel warehouse stocks will make things more difficult for consumers who had hoped to replenish inventories through warehouse buying. The government's move was a protective one to assure steel for defense contractors.

### Steel Output, Operating Rates

	This Week	Last Week	Month Ago	Year Ago
<b>Production</b> (Net tons, 000 omitted)	357	357	2,375	2,219
<b>Ingot Index</b> (1947-1949=100)	22.2	22.2	147.9	138.0
<b>Operating Rates</b>				
Chicago	6.0	5.0	100.0	96.0
Pittsburgh	6.0	6.0*	96.0	92.0
Philadelphia	0.0	0.0	102.0	94.0
Valley	13.0	13.0	97.0	95.0
West	26.0	24.0*	99.0	92.0
Detroit	25.0	25.0*	99.0	85.0
Buffalo	0.0	5.0	105.0	86.0
Cleveland	0.0	0.0	99.5	99.0
Birmingham	3.5	3.5	23.5	94.0
S. Ohio River	66.0	63.0*	90.0	82.0
Wheeling	58.0	58.0	103.0	99.0
St. Louis	95.0	68.0	102.0	92.0
Northeast	47.0	47.0	80.0	87.0
<b>Aggregate</b>	14.5	14.5	96.5	92.0

\*Revised \*\*Corrected

### Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
<b>Composite price</b>				
Finished Steel, base	5.179	5.179	5.179	5.178
Pig Iron (Gross Ton)	\$60.61	\$60.38**	\$60.29	\$59.09
Scrap, No. 1 hvy (gross ton)	\$44.83	\$44.83	\$44.83	\$38.50
<b>Nonferrous</b>				
Aluminum ingot	25.90	25.90	25.90	23.20
Copper, electrolytic	46.00	46.00	46.00	36.00
Lead, St. Louis	15.80	15.80	15.80	14.80
Magnesium	34.50	34.50	34.50	29.25
Nickel, electrolytic	64.50	64.50	64.50	67.67
Tin, Straits, N. Y.	96.25	94.75	94.00	95.25
Zinc, E. St. Louis	13.50	13.50	13.50	12.50

## First Wave of Increases Hits

**Mills still producing lift prices . . . Want protection against retroactive wage increases . . . Bars, sheet, strip and stainless advance in some areas . . . Pig iron up, too.**

◆ THE INITIAL WAVE of increases in steel products came this week as some operating mills (below) made advances to cover any retroactive wage contracts with the unions.

Upward revisions were made all along the line with higher prices being reported for bars, billets, sheet and strip. Stainless products also advanced as did wire, pig iron and wrought iron.

In the East, Alan Wood advanced strip and sheet \$8 a ton and plate \$9 a ton. Copperweld moved up bars \$10 a ton. Milton Steel Products Div. (Merritt-Chapman & Scott Corp.), hiked carbon

and reinforcing bars \$9 a ton.

In the Midwest, Wisconsin Steel Co. put through an increase of a flat 25 cents per hundredweight. Detroit Steel Corp. announced new prices \$12 a ton higher on strip, sheet and wire.

Continental Steel Corp. raised prices an average of \$5 a ton on wire products.

Two Eastern producers, Washington Steel Corp. and Jessop Steel Corp. (both of Washington, Pa.), listed advances in stainless products. Washington moved up sheet and strip 8 pct of the net price effective July 9, while Jessop raised bars and plates 8 pct of

the net price effective July 10.

Green River Steel Corp., announced an increase on carbon and alloy forging billets of \$12 per ton. Company has a union contract running until Sept. 30.

Two pig iron producers operating this week are Pittsburgh Coke & Chemical Co. and Tennessee Products & Chemical Corp. Tennessee's hike of \$4 per ton for pig iron applied only to customers in the Southeast area, the firm reports.

Other changes:

U. S. Pipe & Foundry Co. and Woodward Iron Co. announce increases of \$4 per ton in pig iron prices. The U. S. Pipe raise was effective July 2, while Woodward's price hike went into effect July 4.

It should be noted that, since Southern producers did not increase pig iron \$1.50 earlier in the year when other areas did, the new prices now could be considered an increase of only \$2.50 a ton rather than \$4.

A. M. Byers Co. put through a 7 pct increase in wrought iron prices.

## Where the Fires are Still Burning

Steel producers still operating include:

Company	Annual Ingot Capacity (net tons)	Status
Armco Steel Corp.		Independent union
Butler	543,000	
Middletown	1,815,000	
Zanesville		
Braeburn Alloy Steel Corp.	20,730	Have day-to-day contract extension
A. M. Byers Co.	90,000	Contract extended 30 days
Colonial Steel Co.	30,000	Contract until July 31
Firth Sterling, Inc.	25,040	Contract until July 31
Jessop Steel Co.	33,490	Contract until Aug. 31
Latrobe Steel Co.	24,000	Contract until July 31
Universal-Cyclops Steel Co.	70,110	Contract until July 31
Vanadium Alloys Steel Co.	12,000	Has no union
Vulcan Crucible Co.	9,100	Contract until Aug. 15
Alan Wood Steel Co.	825,000	
Carpenter Steel Co.	73,700	Independent union
Eastern Stainless Steel Co.	50,000	Contract until Aug. 31
Midvale-Hoppenstall Co.	325,000	
Milton Steel Products Div., Merritt, Chapman & Scott Corp.	90,000	Contract until Jan. 1957
Phoenix Iron and Steel Co., Barium Steel Corp.		Contract until Aug. 31
Harrisburg	400,000	
Phoenixville	350,000	
Copperweld Steel Co.	618,380	15-day extension; contract can be reopened indefinitely
Empire Steel Co.	500,000	Contract until Aug. 31
Kaiser Steel Corp.	1,536,000	
Detroit Steel Co.		Contract until July 31
Pittsfield	1,290,000	
New Haven, Conn.		
McLouth Steel Corp.	1,380,000	Contract extended 30 days (Now down two weeks for maintenance)
Rotary Electric Steel Corp.	300,000	Contract extended 30 days (Now down two weeks for maintenance)

Company	Annual Ingot Capacity (net tons)	Status
Conners Steel Div., H. K. Porter Co., Inc.	115,000	Contract until Sept.
Weirton Steel Co., National Steel Corp.	2,800,000	
Newport Steel Corp., Merritt-Chapman & Scott	708,500	Has 15-day extension
Timken Roller Bearing Co.	700,000	Resumes after vacation period to July 15 on contract running until Aug. 24
Granite City Steel Co.	1,080,000	
Laclede Steel Co.	500,000	
Northeastern Steel Corp.	303,200	Contract until Aug. 1
Continental Steel Corp.	294,000	
Wisconsin Steel Works, International Harvester Co.	731,000	
Borg-Warner Corp.		Negotiating dates will range from July 31 into 1957
Chicago	100,000	
New Castle, Ind.	64,000	

**CAPTIVE MILLS:** In addition, the following captive steel mills are in operation: Alco Products, Inc., Ford Motor Co., Edgewater Steel Co., Union Electric Steel Co., and Mesta Machine Co.

**SEMI- and NON-INTEGRATED MILLS:** These semi- and non-integrated mills are operating: Washington Steel Corp., Pilgrim Drawn Steel Co., Plymouth Steel Co., Production Steel Co., Southern Electric Steel Co., Superior Steel Corp., Wyckoff Steel Co., (Chicago, Empire and New England Works), Blair Strip Steel Co., Green River Steel Corp., Columbus Tool Steel, A. Finkl & Sons, Joslyn Mfg. & Supply Co., Keystone Steel & Wire Co., and Keokuk-Electro Metals Co.



# Comparison of Prices

(Effective July 10, 1956)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	July 10 1956	July 2 1956	June 12 1956	July 13 1955
<b>Flat-Rolled Steel: (per pound)</b>				
Hot-rolled sheets	4.325¢	4.325¢	4.325¢	4.325¢
Cold-rolled sheets	5.325	5.325	5.325	5.325
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.85
Hot-rolled strip	4.325	4.325	4.325	4.325
Cold-rolled strip	6.28	6.28	6.28	6.45
Plate	4.52	4.52	4.52	4.50
Plates, wrought iron	10.40	10.40	10.40	9.30
Stainl's C-R strip (No. 302)	44.50	44.50	44.50	44.50

<b>Tin and Terneplate: (per base box)</b>				
Tinplate (1.50 lb.) cokes	\$9.85	\$9.85	\$9.85	\$9.05
Tinplates, electro (0.50 lb.)	8.65	8.65	8.65	7.75
Special coated mfg. terms	9.10	9.10	9.10	7.95

<b>Bars and Shapes: (per pound)</b>				
Merchant bars	4.65¢	4.65¢	4.65¢	4.65¢
Cold finished bars	5.90	5.90	5.85	5.90
Alloy bars	5.65	5.65	5.65	5.65
Structural shapes	4.60	4.60	4.60	4.60
Stainless bars (No. 302)	38.25	38.25	38.25	38.25
Wrought iron bars	11.50	11.50	11.50	10.40

<b>Wire: (per pound)</b>				
Bright wire	6.60¢	6.60¢	6.60¢	6.25¢

<b>Rails: (per 100 lb.)</b>				
Heavy rails	\$4.725	\$4.725	\$4.725	\$4.725
Light rails	5.65	5.65	5.65	5.65

<b>Semi-finish Steel: (per net ton)</b>				
Rerolling billets	\$68.50	\$68.50	\$68.50	\$68.50
Slabs, rerolling	68.50	68.50	68.50	68.50
Forging billets	84.50	84.50	84.50	84.50
Alloy blooms, billets, slabs	96.00	96.00	96.00	96.00

<b>Wire Rod and Skelp: (per pound)</b>				
Wire rods	5.025¢	5.025¢	5.025¢	5.025¢
Skelp	4.225	4.225	4.225	4.225

<b>Finished Steel Composite: (per pound)</b>				
Base price	5.179¢	5.179¢	5.179¢	5.178¢

**Finished Steel Composite**  
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite**  
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

**Steel Scrap Composite**  
Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	July 10 1956	July 2 1956	June 12 1956	July 13 1955
<b>Pig Iron: (per gross ton)</b>				
Foundry del'd Phila.	\$65.26	\$65.26	\$65.26	\$63.69
Foundry Valley	60.50	60.50	60.50	59.00
Foundry, Southern Cin'ti	62.93	62.93	62.93	62.93
Foundry, Birmingham	57.67	58.33	58.00	55.38
Foundry, Chicago	60.50	60.50	60.50	59.00
Basic del'd Philadelphia	64.48	64.48	64.48	62.77
Basic, Valley furnace	60.00	60.00	60.00	58.50
Malleable, Chicago	60.50	60.50	60.50	59.00
Malleable, Valley	60.50	60.50	60.50	59.00
Ferromanganese, cents per lb.	9.50¢	9.50¢	9.50¢	9.50¢
‡ 74.76 pct Mn base.				

<b>Pig Iron Composite: (per gross ton)</b>				
Pig iron	\$60.61	\$60.38**	\$60.20	\$59.09

<b>Scrap: (per gross ton)</b>				
No. 1 steel, Pittsburgh	\$44.50	\$44.50	\$44.50	\$39.50
No. 1 steel, Phila. area	46.50	46.50	46.50	39.50
No. 1 steel, Chicago	43.50	43.50	43.50	36.50
No. 1 bundles, Detroit	39.50	37.50	37.50	32.50
Low phos., Youngstown	50.00	46.50	50.50	40.50
No. 1 mach'y cast, Pittsburgh	54.50	54.50	55.50	43.50
No. 1 mach'y cast, Philadel'a.	54.50	54.50	54.50	44.50
No. 1 mach'y cast, Chicago	47.50	47.50	48.50	49.50

<b>Steel Scrap Composite: (per gross ton)</b>				
No. 1 heavy melting scrap	\$44.83	\$44.83	\$44.83	\$38.50

<b>Coke, Connellsville: (per net ton at oven)</b>				
Furnace coke, prompt	\$14.50	\$14.50	\$14.50	\$13.25
Foundry coke, prompt	17.50	17.50	17.40	16.25

<b>Nonferrous Metals: (cents per pound to large buyers)</b>				
Copper, electrolytic, Conn.	\$46.00	\$46.00	\$46.00	\$36.00
Copper, Lake, Conn.	48.00	48.00	48.00	36.00
Tin, Straits, New York	96.25	94.75	94.00	95.25
Zinc, East St. Louis	18.50	18.50	18.50	12.50
Lead, St. Louis	18.50	18.50	18.50	14.50
Aluminum, virgin ingot	25.90	25.90	25.90	23.50
Nickel, electrolytic	64.50	64.50	64.50	67.67
Magnesium, ingot	34.50	34.50	34.50	29.25
Antimony, Laredo, Tex.	38.00	38.00	38.00	28.50

† Tentative. ‡ Average. \* Revised. \*\* Corrected.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

## STAINLESS STEEL

Base price cents per lb. f.o.b. mill.

← To identify producers, see Key on p. 142 →

Producing Point	Basic	Fdry.	Mall.	Beas.	Low Phos.
Bethlehem B3	62.00	62.50	63.00	63.50	
Birdsboro, Pa. B6	62.00	62.50	63.00	63.50	
Birmingham R3	54.50	55.00			
Birmingham W9	58.50	59.00	63.00		
Birmingham U4	58.50	59.00	63.00		
Buffalo R3	60.00	60.50	61.00	61.50	
Buffalo H1	60.00	60.50	61.00	61.50	
Buffalo W6	60.00	60.50	61.00	61.50	
Chester C17	62.00	62.50	63.00		
Chicago J4	60.00	60.50	60.50	61.00	
Cleveland A5	60.00	60.50	60.50	61.00	65.00†
Cleveland R3	60.00	60.50	60.50	61.00	
Duluth J4	60.00	60.50	60.50	61.00	65.00
Erie J4	60.00	60.50	60.50	61.00	65.00
Everett M6	63.75	64.25			
Fontana K1	67.50	68.00			
Geneva, Utah C7	60.00	60.50			
Granite City C2	61.90	62.40	62.90		
Hubbard Y1		60.50			
Lane Star L3		55.00			
Midland C11	60.00				
Minneapolis C6	62.00	62.50	63.00		
Moscow P6	60.00				
Neville Is. P4	60.00	60.50	60.50	61.00	65.00†
N. Tonawanda T1	60.00	60.50	61.00	61.50	
Pittsburgh U1	60.00	60.50	60.50	61.00	
Sharpsville S3	60.00	60.50	60.50	61.00	
Sa. Chicago R3	60.00		60.50		
Steelton R3	62.00	62.50	63.00	63.50	
Svealand A2	62.00	62.50	63.00	63.50	
Toledo J4	60.00	60.50	60.50	61.00	
Troy, N. Y. R3	62.00	62.50	63.00	63.50	68.00
Youngstown Y1		60.50	61.00		

**DIFFERENTIALS:** Add, 5¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 5¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct, 3¢ per ton for 0.5 to 0.75 pct nickel, 1¢ for each additional, 0.25 pct nickel \* Add \$1.00 for 0.31-0.60 pct phos. † Intermediate low phos. Silvery iron: Buffalo, H1, \$70.25; Jackson, J1, G1, \$49.00. Add \$1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferro-silicon prices are \$1 over comparable silvery iron.

Product	201	202	301	302	303	304	316	321	348	410	416	430
Ingot, reroll.	18.50	19.75	19.25	20.50	—	21.75	33.00	28.50	35.25	15.00	—	15.25
Slabs, billets, reroll.	23.00	25.50	23.75	24.25	24.75	27.30	41.75	33.50	44.50	19.50	—	19.75
Forg. dcs., die blks., rgs.	—	—	—	—	—	—	—	—	—	—	—	—
Billets, forging	—	31.00	31.75	32.00	34.75	33.75	52.75	39.75	52.50	25.50	26.00	26.00
Bars, struct.	—	36.75	38.00	38.25	41.00	40.25	62.75	47.25	62.00	38.50	31.00	31.00
Plates	—	38.75	40.00	40.25	42.75	43.00	64.00	51.25	64.75	31.75	33.00	32.25
Sheets	42.25	42.50	44.25	44.50	52.25	47.25	70.25	54.25	75.50	36.25	—	36.75
Strip, hot-rolled	31.00	33.50	32.00	34.50	—	37.25	59.75	45.75	61.25	28.00	—	28.75
Strip, cold-rolled	39.00	42.50	41.00	44.50	—	47.25	78.25	54.25	75.50	36.25	—	36.75
Wire CF, HR; Rod HR	—	—	34.00	36.25	39.00	38.25	59.75	45.00	59.00	29.00	29.50	29.50

### STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2 (2.25¢ lower on Type 430), J2; Baltimore, Md., A7; Middletown, O., A7; Massillon, O., R3; Gary, Ind., U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, J4; Philadelphia, D5.

Strip: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Lechburg, Pa., A3; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; S. Chicago, Ill., U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T3; Ft. Wayne, J4; Philadelphia, D5; Detroit, R3; Gary, Ind.

Bar: Baltimore, A7; S. Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1; F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; S. Chicago, Ill., U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T3; Ft. Wayne, J4; Philadelphia, D5; Detroit, R3; Gary, Ind.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, R3; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structural: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, U1.

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C15; Philadelphia, D5; Vandergrift, Pa., U1; Gary, Ind.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, C11; Ferndale, Mich., A3; Washington, Pa., J2.

Forgings billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R3; Munhall, Pa., S. Chicago, U1.

## Market Firmness Continues

**Low mill inventories, export sales vitality partly explain unexpected strength . . . Some price increases reported but present levels likely to subside in two weeks.**

◆ WITH THE STEEL strike dragging into its second week, the scrap market is showing surprising strength.

Many expected a sharp drop in prices following the stalemate in negotiations. But the deadline came and went and the scrap market still holds remarkably firm. Instead of dropping, some prices went up; notably, railroad grades in Pittsburgh, steelmaking grades in Detroit and New York and foundry grades in St. Louis and Boston.

Responsible for this turn of events are: 1) Mill inventories were so low they could still afford to lay down scrap even though not operating. 2) A number of smaller mills are still operating. 3) Auto industry cutbacks have reduced the amount of scrap available. 4) Shortage of pig iron has sent foundries into the market. 5) Foreign buyers are stocking up in anticipation of an embargo when the strike is over.

Adding to the scrap scarcity are seasonal summer shutdowns by fabricators. But all of these factors can only be regarded as a temporary cushion for the scrap trade. At most, the fair weather probably won't last more than two weeks.

The mills by that time will have laid down all the scrap they can handle. The same goes for the foreign buyers. And many fabricators will be winding up their vacation schedules.

After that, the scrap market will depend on settlement of the steel strike. Meanwhile, THE IRON AGE Composite remained at \$44.83.

**Pittsburgh . . .** The market here shows unexpected strength. Some brokers are paying \$45 and \$46 to pry shipments of No. 1 heavy melting from dealers. A new order by a mill on the fringe of the district is slightly

above the going price—even with freight differential—but is not pulling No. 1 heavy from Pittsburgh. Railroad grades are up \$1 on the latest lists. Brokers are finding it difficult to cover orders of low phos at \$52. A major mill is reported talking about laying down scrap at \$2 under the last price paid. Such an offer would find few takers.

**Chicago . . .** Prices generally held firm. Purchases by mills still in operation moved the spread on No. 2 grades upward by \$1. In an absence of heavy trading, few dealers have shown any sign of weakening, and seem to prefer an attempt at inventory-building. There has been some effort to lower dealer buying prices, but in view of the remarkably strong tone of the market this has met with little success.

**Philadelphia . . .** Dealers here showed some surprise at the firmness of the market. But it was not expected to last. Two contributing factors were export sales and laying down of considerable amounts of scrap by a major dealer on behalf of an area mill. The foreign ship tied up in port was expected to be loaded within a week and the laying down operations completed shortly afterward. A price dip may be in the offing then.

**New York . . .** Despite the steel strike—or maybe because of it—scrap prices are on the rise here as those mills still operating reach out for metalies. No. 1 heavy melting is now \$42 top. Other steelmaking and blast furnace grades also have risen. A contributing factor is brisker export activity caused by foreign mills' press for delivery against a feared embargo later.

**Detroit . . .** A surprising amount of strength was reflected in the market as broker buying prices advanced despite the steel strike. Main reasons for the show of strength are (1) at

least two local mills are laying down scrap, and (2) a shortage due to cutbacks in automotive production.

**Cleveland . . .** At least three mills here and in the Valley are accepting scrap. Struck plants are laying it down in dealer yards and others taking it in directly. Scrap collections are off heavily and many plants are holding what they have in speculation of a booming market after the strike ends. Prices being paid for tonnages of electric furnace grades in the Valley are in the \$49-\$50 range with some premium material moving at \$51.

**Birmingham . . .** The Southern scrap market is quiet except for a little movement to the north to mills not on strike. The electric furnace and cast markets are firm. But with short supplies of all grades in dealers' yards, coupled with the increase in pig iron prices, brokers are predicting higher prices soon.

**St. Louis . . .** Mills in this district continue to operate at near capacity and are laying down all scrap offered. The market is strong and prices of most items are higher—based on sales. Brokers say supplies are difficult to obtain.

**Cincinnati . . .** Ohio River Valley is one of the strongest steel producing points in the country at present, with Armco, Newport, Portsmouth and Weirton working. River shipments are fairly heavy with few mills holding up shipments. Monthly prices for top area consumers were unchanged from last month and additional sales to working mills are expected.

**Buffalo . . .** This market showed signs of weakening and a drop in prices is expected if the strike continues. An estimated 2000 tons of scrap is being held up in lake boats and barges.

**Boston . . .** Primary and secondary steelmaking grades registered a \$2 price increase due to activity in the market of a few independent mills and some export activity.

**West Coast . . .** Export activity, moving at a fairly brisk pace even before the steel strike, has picked up a bit more. This, combined with the seasonal falloff of scrap collections, has resulted in prices holding firm despite the shutdown. \*

## Lukens "T-1" Steel Takes on Tough Job for C & O Railway!



Horne Brothers of Newport News, first-line fabricators to the shipping industry, are building several new, improved coal trimming machines for the C & O Railway. Lukens "T-1" steel was

specified to cut weight, combine strength and abrasion resistance. A number of other Horne Brothers' projects of Lukens "T-1" steel are already in the works.

*Fabricator of unique new coal loader says:*

**"NEVER WORKED WITH AS TOUGH AND STRONG A STEEL THAT'S SO EASY TO WELD!"**

■ *Enthusiastic* is the word for Horne Brothers' reports on Lukens "T-1" steel. They call it the best steel yet to combine strength and toughness, impact and abrasion resistance, and the all-important feature of excellent weldability.

Lukens "T-1" steel is economical, too. On this coal loading machine, for example, Horne Brothers was able to effect a 25% reduction in

overall plate thickness—a direct result of this new steel's great strength. The finished machine will weigh far less than previous trimmers, operate with greater efficiency, less maintenance and increased life expectancy.

No wonder Horne Brothers is so well satisfied. No wonder they are planning to build more equipment of Lukens "T-1" steel—*right away!*

If your problem is equipment

weight...abrasion, impact or atmospheric corrosion...the need for toughness at temperature extremes...it will pay you to investigate this amazing new alloy steel now.

For the latest in fabrication techniques and specifications, write to Manager, Marketing Service, 847 Lukens Building, Lukens Steel Company, Coatesville, Pennsylvania.

# LUKENS "T-1" STEEL



THE NEWEST IN A COMPLETE LINE OF ALLOY STEELS  
LUKENS STEEL COMPANY, COATESVILLE, PENNSYLVANIA



# Scrap Prices (Effective July 10, 1956)

## Pittsburgh

No. 1 hvy. melting.....	\$44.00 to \$45.00
No. 2 hvy. melting.....	39.00 to 40.00
No. 1 bundles.....	44.00 to 45.00
No. 2 bundles.....	36.00 to 37.00
Machine shop turn.....	33.00 to 34.00
Mixed bor. and ma. turn.....	33.00 to 34.00
Shoveling turnings.....	35.00 to 37.00
Cast iron borings.....	36.00 to 37.00
Low phos. punch'g plate.....	51.00 to 52.00
Heavy turnings.....	42.00 to 43.00
No. 1 RR. hvy. melting.....	52.00 to 53.00
Scrap rails, random lgth.....	63.00 to 64.00
Rails 2 ft and under.....	67.00 to 68.00
RR. steel wheels.....	59.00 to 60.00
RR. spring steel.....	59.00 to 60.00
RR. couplers and knuckles.....	59.00 to 60.00
No. 1 machinery cast.....	45.00 to 46.00
Cupola cast.....	45.00 to 46.00
Heavy breakable cast.....	44.00 to 45.00

## Chicago

No. 1 hvy. melting.....	\$43.00 to \$44.00
No. 2 hvy. melting.....	36.00 to 38.00
No. 1 factory bundles.....	49.00 to 50.00
No. 1 dealers' bundles.....	44.00 to 45.00
No. 2 dealers' bundles.....	32.00 to 34.00
Machine shop turn.....	23.00 to 24.00
Mixed bor. and turn.....	25.00 to 26.00
Shoveling turnings.....	25.00 to 26.00
Cast iron borings.....	25.00 to 26.00
Low phos. forge cups.....	54.00 to 55.00
Low phos. punch'g plate.....	53.00 to 54.00
Low phos. 3 ft and under.....	60.00 to 61.00
No. 1 RR. hvy. melting.....	49.00 to 50.00
Scrap rails, random lgth.....	60.00 to 61.00
Rerolling rails.....	62.00 to 63.00
Rails 2 ft and under.....	67.00 to 68.00
Locomotive tires, cut.....	55.00 to 56.00
Cut bolsters & side frames.....	55.00 to 56.00
Angles and splice bars.....	61.00 to 62.00
RR. steel car axles.....	68.00 to 70.00
RR. couplers and knuckles.....	54.00 to 55.00
No. 1 machine cast.....	47.00 to 48.00
Cupola cast.....	44.00 to 45.00
Heavy breakable cast.....	38.00 to 39.00
Cast iron brake shoe.....	33.00 to 34.00
Cast iron wheel.....	49.00 to 50.00
Malleable.....	58.00 to 59.00
Stove plate.....	40.00 to 41.00
Steel car wheels.....	54.00 to 55.00

## Philadelphia Area

No. 1 hvy. melting.....	\$46.00 to \$47.00
No. 2 hvy. melting.....	37.00 to 38.00
No. 1 bundles.....	46.00 to 47.00
No. 2 bundles.....	35.00 to 36.00
Machine shop turn.....	31.00 to 32.00
Mixed bor. short turn.....	33.00 to 34.00
Cast iron borings.....	37.00 to 38.00
Shoveling turnings.....	35.00 to 36.00
Clean cast chem. borings.....	42.00 to 43.00
Low phos. 5 ft and under.....	50.00 to 51.00
Low phos. 3 ft and under.....	51.00 to 52.00
Low phos. punch'g.....	51.00 to 52.00
Elec. furnace bundles.....	49.00 to 50.00
Heavy turnings.....	42.00 to 44.00
RR. steel wheels.....	55.00 to 56.00
RR. spring steel.....	55.00 to 56.00
Rails 18 in. and under.....	63.00 to 64.00
Cupola cast.....	47.00 to 48.00
Heavy breakable cast.....	50.00 to 51.00
Cast iron car wheels.....	57.00 to 58.00
Malleable.....	64.00 to 65.00
Unstripped motor blocks.....	38.00 to 39.00
No. 1 machinery cast.....	44.00 to 45.00

## Cleveland

No. 1 hvy. melting.....	\$43.00 to \$44.00
No. 2 hvy. melting.....	35.00 to 36.00
No. 1 bundles.....	43.00 to 44.00
No. 2 bundles.....	31.00 to 32.00
No. 1 busheling.....	43.00 to 44.00
Machine shop turn.....	28.00 to 29.00
Mixed bor. and turn.....	32.00 to 33.00
Shoveling turnings.....	32.00 to 33.00
Cast iron borings.....	32.00 to 33.00
Cut struct'l & plates, 3 ft & under.....	61.00 to 62.00
Drop forge flashings.....	45.00 to 46.00
Low phos. punch'g plate.....	44.00 to 45.00
Poundry steel, 3 ft & under.....	49.00 to 50.00
No. 1 RR. heavy melting.....	48.00 to 49.00
Rails 2 ft and under.....	67.00 to 68.00
Rails 18 in. and under.....	68.00 to 69.00
Railroad grate bars.....	39.00 to 40.00
Steel axle turnings.....	35.00 to 36.00
Railroad cast.....	53.00 to 54.00
No. 1 machinery cast.....	53.00 to 54.00
Stove plate.....	50.00 to 51.00
Malleable.....	59.00 to 60.00

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

## Youngstown

No. 1 hvy. melting.....	\$45.00 to \$46.00
No. 2 hvy. melting.....	34.00 to 35.00
No. 1 bundles.....	45.00 to 46.00
No. 2 bundles.....	32.00 to 33.00
Machine shop turn.....	27.00 to 28.00
Shoveling turnings.....	31.00 to 32.00
Cast iron borings.....	31.00 to 32.00
Low phos. plate.....	49.00 to 51.00

## Buffalo

No. 1 hvy. melting.....	\$44.00 to \$45.00
No. 2 hvy. melting.....	36.00 to 37.00
No. 1 busheling.....	44.00 to 45.00
No. 2 bundles.....	44.00 to 45.00
No. 3 bundles.....	33.00 to 34.00
Machine shop turn.....	25.00 to 26.00
Mixed bor. and turn.....	27.00 to 28.00
Shoveling turnings.....	27.00 to 28.00
Cast iron borings.....	27.00 to 28.00
Low phos. plate.....	53.00 to 54.00
Scrap rails, random lgth.....	67.00 to 68.00
Rails 2 ft and under.....	65.00 to 66.00
RR. steel wheels.....	60.00 to 61.00
RR. spring steel.....	60.00 to 61.00
RR. couplers and knuckles.....	60.00 to 61.00
No. 1 machinery cast.....	50.00 to 51.00
No. 1 cupola cast.....	48.00 to 49.00

## Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting.....	\$39.00 to \$40.00
No. 2 hvy. melting.....	31.00 to 32.00
No. 1 bundles, openhearth.....	39.00 to 40.00
No. 2 bundles.....	28.00 to 29.00
New busheling.....	39.00 to 40.00
Drop forge flashings.....	38.50 to 39.50
Machine shop turn.....	19.00 to 20.00
Mixed bor. and turn.....	22.00 to 23.00
Shoveling turnings.....	22.00 to 23.00
Cast iron borings.....	22.00 to 23.00
Low phos. punch'g plate.....	39.00 to 40.00
No. 1 cupola cast.....	41.00 to 42.00
Heavy breakable cast.....	34.00 to 35.00
Stove plate.....	35.00 to 36.00
Automotive cast.....	44.00 to 45.00

## St. Louis

No. 1 hvy. melting.....	\$38.00 to \$39.00
No. 2 hvy. melting.....	34.00 to 35.00
No. 1 bundles.....	39.50 to 40.50
No. 2 bundles.....	30.00 to 31.00
Machine shop turn.....	24.00 to 25.00
Cast iron borings.....	26.00 to 27.00
Shoveling turnings.....	27.00 to 28.00
No. 1 RR. hvy. melting.....	48.50 to 49.50
Rails, random lengths.....	57.00 to 58.00
Rails 18 in. and under.....	62.00 to 63.00
Locomotive tires uncut.....	53.00 to 54.00
Angles and splice bars.....	55.00 to 56.00
Std. steel car axles.....	65.00 to 66.00
RR. specialties.....	54.00 to 55.00
Cupola cast.....	46.00 to 47.00
Heavy breakable cast.....	37.00 to 38.00
Cast iron brake shoes.....	42.00 to 43.00
Stove plate.....	40.00 to 41.00
Cast iron car wheels.....	47.00 to 48.00
Rerolling rails.....	69.00 to 70.00
Unstripped motor blocks.....	36.00 to 37.00

## Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting.....	\$36.00 to \$37.00
No. 2 hvy. melting.....	27.00 to 28.00
No. 1 bundles.....	36.00 to 37.00
No. 2 bundles.....	25.00 to 26.50
No. 1 busheling.....	36.00 to 37.00
Elec. furnace, 3 ft & under.....	37.00 to 38.00
Machine shop turn.....	22.00 to 22.50
Mixed bor. and short turn.....	23.00 to 23.50
Shoveling turnings.....	24.00 to 24.50
Clean cast chem. borings.....	28.00 to 29.00
No. 1 machinery cast.....	41.50 to 42.50
Mixed cupola cast.....	36.00 to 36.50
Heavy breakable cast.....	39.50 to 40.50
Stove plate.....	34.00 to 35.00
Unstripped motor blocks.....	25.50 to 26.00

## New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting.....	\$41.00 to \$42.00
No. 2 hvy. melting.....	33.00 to 34.00
No. 1 bundles.....	31.00 to 32.00
Machine shop turn.....	24.00 to 25.00
Mixed bor. and turn.....	24.00 to 25.00
Shoveling turnings.....	28.00 to 29.00
Clean cast chem. borings.....	29.00 to 30.00
No. 1 machinery cast.....	46.00 to 46.50
Mixed yard cast.....	43.00 to 43.50
Charging box cast.....	43.00 to 43.50
Heavy breakable cast.....	43.00 to 43.50
Unstripped motor blocks.....	32.00 to 33.00

## Birmingham

No. 1 hvy. melting.....	\$34.00 to \$35.00
No. 2 hvy. melting.....	32.00 to 33.00
No. 1 bundles.....	34.00 to 35.00
No. 2 bundles.....	24.00 to 25.00
No. 1 busheling.....	34.00 to 35.00
Machine shop turn.....	25.00 to 26.00
Shoveling turnings.....	27.00 to 28.00
Cast iron borings.....	26.00 to 27.00
Electric furnace bundles.....	39.00 to 40.00
Bar crops and plate.....	51.00 to 52.00
Structural and plate, 2 ft.....	49.00 to 50.00
No. 1 RR. hvy. melting.....	45.00 to 46.00
Scrap rails, random lgth.....	54.00 to 55.00
Rails, 18 in. and under.....	59.00 to 60.00
Angles & splice bars.....	54.00 to 55.00
Rerolling rails.....	64.00 to 65.00
No. 1 cupola cast.....	48.50 to 49.50
Stove plate.....	32.00 to 33.00
Charging box cast.....	37.00 to 38.00
Cast iron car wheels.....	39.00 to 40.00
Unstripped motor blocks.....	37.50 to 38.50
Mashed tin cans.....	15.00 to 16.00

## Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting.....	\$43.50 to \$43.50
No. 2 hvy. melting.....	33.50 to 34.50
No. 1 bundles.....	42.50 to 43.50
No. 2 bundles.....	31.50 to 32.50
Machine shop turn.....	25.00 to 26.00
Mixed bor. and turn.....	29.00 to 30.00
Shoveling turnings.....	29.00 to 30.00
Cast iron borings.....	28.00 to 29.00
Low phos. 18 in. & under.....	51.00 to 52.00
Rails, random lengths.....	57.00 to 58.00
Rails, 18 in. and under.....	64.00 to 65.00
No. 1 cupola cast.....	43.00 to 44.00
Hvy. breakable cast.....	43.00 to 44.00
Drop broken cast.....	52.00 to 53.00

## San Francisco

No. 1 hvy. melting.....	\$43.00
No. 2 hvy. melting.....	40.00
No. 1 bundles.....	42.00
No. 2 bundles.....	35.00
No. 3 bundles.....	29.00
Machine shop turn.....	24.00
Cast iron borings.....	25.00
No. 1 RR. hvy. melting.....	42.00
No. 1 cupola cast.....	48.00

## Los Angeles

No. 1 hvy. melting.....	\$42.00
No. 2 hvy. melting.....	38.00
No. 1 bundles.....	41.00
No. 2 bundles.....	31.00
No. 3 bundles.....	27.00
Machine shop turn.....	\$21.00 to 22.00
Shoveling turnings.....	24.00
Cast iron borings.....	24.00
Elec. furn. 1 ft and under.....	42.00
No. 1 RR. hvy. melting.....	42.00
No. 1 cupola cast.....	45.00

## Seattle

No. 1 hvy. melting.....	\$44.00
No. 2 hvy. melting.....	40.00
No. 3 bundles.....	31.00
No. 2 bundles.....	27.00
No. 1 cupola cast.....	45.00
Mixed yard cast.....	45.00

## Hamilton, Ont.

No. 1 hvy. melting.....	\$45.00
No. 2 hvy. melting.....	38.00
No. 1 bundles.....	43.00
No. 2 bundles.....	35.00
Mixed steel scrap.....	37.00
Bushelings.....	33.50
Bush, new fact, prep'd.....	41.00
Bush, new fact, unprep'd.....	37.00
Machine shop turn.....	31.00
Short steel turn.....	25.00
Mixed bor. and turn.....	23.00
Rails, rerolling.....	51.00
Cast scrap.....	50.00





**A SYMBOL OF LEADERSHIP  
IN IRON & STEEL SCRAP  
SINCE 1889**

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**EXPORTS-IMPORTS LIVINGSTON & SOUTHARD, INC.** 99 Park Ave., New York, N. Y. Cable Address: FORENTRACO

# Phelps Dodge Slashes Price

**Producer cuts price from 46¢ to 40¢ per lb . . . Others are expected to follow . . . British government will put copper on open market . . . Labor settlements a factor.**

♦ EXPECTED break in the price of U. S. producers copper came this week. Phelps Dodge Corp., second largest producer of domestic copper, took the initiative by reducing its price from 46¢ to 40¢ per lb, effective with shipments of July 10.

Other producers were expected to go along with the reduction.

The reduction had been expected, following negotiation of new labor agreements and the resultant stabilization of employment costs over a three-year period. Phelps Dodge, American Smelting & Refining, and Anaconda have signed contracts. Kennecott is well on the way to a settlement.

Factors favoring a uniform copper price of 40¢ include (1) settlement of contract negotiations, assuring virtually uninterrupted operations over the three-year period; (2) consumers have more substantial stocks and smaller volume of business, and (3) pressure from other sources, including a reduction by custom smelters from 40¢ to 37½¢ per lb.

Also, London Metals Exchange price is fluctuating between 34¢ and 36¢ per lb.

British government further weakened the market by announcing that beginning Aug. 1, it would put on the open market 36,000 tons of copper in 6000 ton lots, presently in its strategic stockpile.

Phelps Dodge mines and refines

all its metal in the U. S. Anaconda and Kennecott depend to a great extent on the yield from Chile. In fact, most of the Anaconda copper now comes from South America.

An interesting sidelight, which gives some idea of the general condition of copper markets today, is that at the same time as custom smelters dropped selling price 2½¢, they increased their scrap purchasing price by ½¢ to 30¢ per lb for No. 2 copper.

Very little finished or scrap copper is moving, due to vacation shutdowns and bearishly inclined mills.

Effect of the British government announcement depends on handling.

Selling on a market that is already sinking could push the price to a dangerously low level. While this would benefit consumers for a short while, it would be serious in the long run since much of the leaner ore being mined today would not be mined if the price sinks. This would at least result in erratic production and defeat the current aim of a stable copper market and price.

**MAGNESIUM . . .** A document drawn up by the members of the Magnesium Assn. and presented to Office of Defense Mobilization chief Arthur Flemming and other key Washington officials contains several paragraphs of direct interest to magnesium consumers.

Initially, the association points out that within 18 months the demand for magnesium will equal production capacity.

Secondly it recommends that high purity magnesium, such as is used primarily as a reducing agent in processing of uranium, titanium and zirconium again be stockpiled.

Magnesium Assn. also made public the fact that plans are all but completed for construction of a new high purity magnesium plant to be owned and operated by a new entry into the primary magnesium production field.

New ferro-silicon process plant will be located somewhere in the Southeast. It is expected that capacity will be about 10,000 tons per year.

Magnesium Assn. says that more specific information will be forthcoming in the near future. Probably holding the project up is matter of fast tax write-off and government contracts. Since high purity metal is used in reduction of the so-called atomic metals, the prospective producer is probably trying to get agreement of the Atomic Energy Commission as well as ODM to government purchase of a chunk of its initial production to carry it until it gets off the ground.

Indications are that these attempts will be successful, and construction will begin sometime in the fall.

**ALUMINUM . . .** Current steel strike definitely affects the aluminum industry in several ways. Most obvious is the fact that major union in the industry is the United Steel Workers. Terms eventually agreed to by steel management and labor will set the pattern for the negotiations already getting underway at Alcoa and Reynolds.

Key feature as to whether the steel strike will benefit, hurt, or have reduced effect on aluminum industry is how long the work stoppage lasts.

Edward C. Mannix, vice president of Nichols Wire & Aluminum Co., says that the demand for aluminum may be considerably increased if the strike lasts from four to six weeks, while a shorter strike will have little direct effect, and a work stoppage of three months or more would seriously hurt aluminum.

Mr. Mannix points out the substitution probability as reason for his initial point. A long strike would hit fabricators who produce goods made of both steel and aluminum. When they run out of steel, production, and consumption of aluminum, will stop, says Mannix.

## Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	July 4	July 5	July 6	July 7	July 9	July 10
Copper, electro, Conn. ....	46.00	46.00	46.00	46.00	46.00	46.00
Copper, Lake, delivered ....	46.00	46.00	46.00	46.00	46.00	46.00
Tin, Straits, New York ....	94.375	94.75	....	96.25	96.25*	
Zinc, East St. Louis ....	13.50	13.50	13.50	13.50	13.50	
Lead, St. Louis ....	15.80	15.80	15.80	15.80	15.80	

Note: Quotations are going prices.

\*Tentative

# FREE

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Waterbury 20, Conn.

Dept. 1A-756

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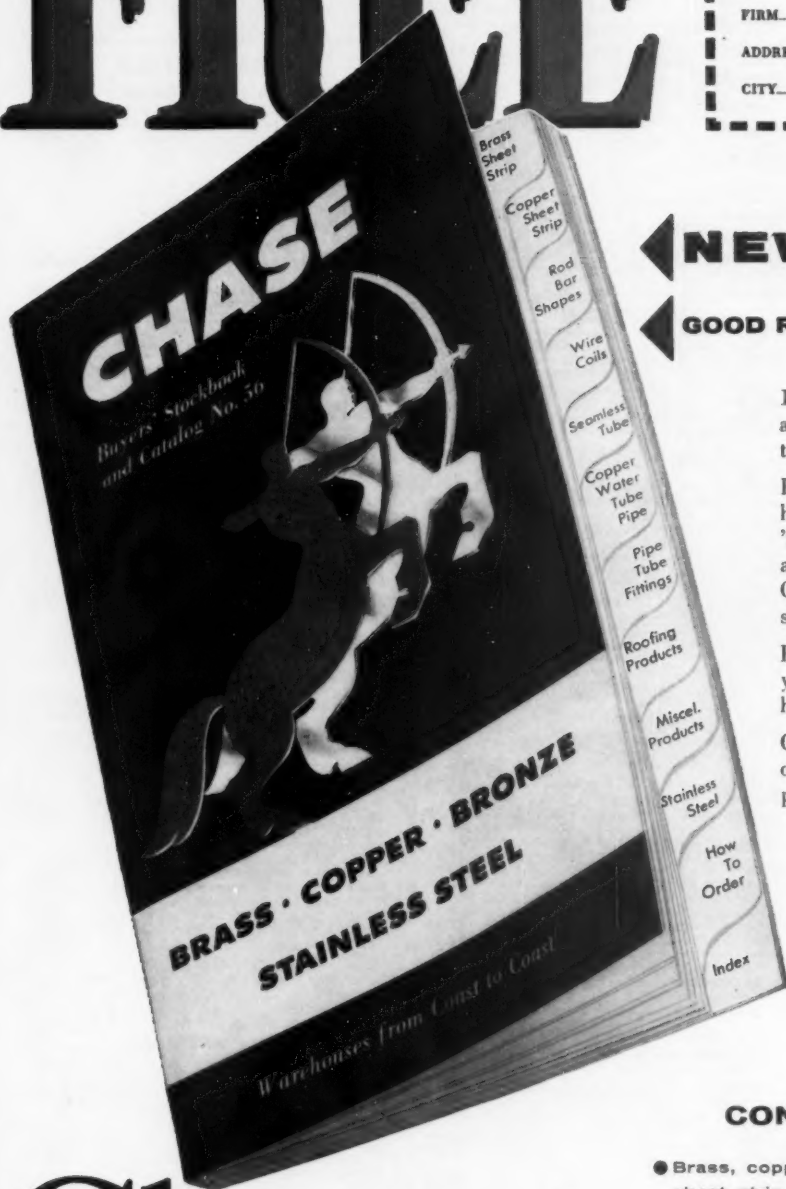
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# Chase

**BRASS & COPPER CO.**

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

*The Nation's Headquarters for Brass, Copper and Stainless Steel*

Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury

July 12, 1956

137

# Nonferrous Prices (Effective July 10, 1956)

## MILL PRODUCTS

(Cents per lb, unless otherwise noted)

### ALUMINUM

(Base 20,000 lb, f.o.b. ship. pt., frt. allowed)

#### Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136- .249	.250- 3.
1100, 3003....	42.3	40.2	39.0	38.0
8052.....	49.8	44.9	43.2	41.4
6061-0.....	46.9	42.7	40.9	40.8

#### Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
8-8.....	43.1-44.8	58.1-61.7
19-16.....	43.8-45.2	50.0-63.3
24-20.....	46.9-47.2	69.2-73.6
36-36.....	55.1-55.7	92.0-95.8

#### Screw Machine Stock—2011-T-3

Size*	3/8	1/2-1/2	3/4-1	1 1/4-1 1/2
Price	56.0	54.9	53.6	51.8

#### Roofing Sheet, Corrugated

(Per sheet, 36" wide base, 14,000 lb)

Length* →	72	96	120	144
.019 gage....	\$1.310	\$1.742	\$2.175	\$2.605
.024 gage....	1.630	2.177	2.707	3.247

## MAGNESIUM

(f.o.b. shipping pt., carload frt. allowed)

### Sheet and Plate

Type →	Gage →	.200- 3.00	.260- 2.00	.188	.061	.083
PSI Stand. Grade.....		66.6	66.6	75	100	
PSI Spec.....		66.9	61.1	108.5	163.1	
Tread Plate.....		67.8	68.9			
Tearing Plate.....	70.2					

#### Extruded Shapes

Factor →	8-8	12-14	24-26	36-38
Comm. Grade (F5).....	66.4- 69.0	67.5- 69.8	73.1- 73.7	84.9- 85.8
Spec. Grade (A321B).....	81.4- 84.0	82.5- 84.8	87.1- 87.7	99.9- 100.8

#### Alloy Ingot

A321B (Die Casting)..... 85 (delivered)  
A321A, A321C, A321D (Sand Casting) 39.25 (Velsco, Tex.)

## NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mfr)

	"A" Nickel	Monel	Inconel
Sheet, CR.....	101	83	99
Strip, CR.....	102	83	101
Rod, Bar, HR.....	87	74	92
Angles, HR.....	87	74	92
Plate, HR.....	87	87	95
Seamless tube.....	133	110	133
Shot, blocks.....	71		

## COPPER, BRASS, BRONZE

(Freight included on 500 lbs)

	Sheet	Wire	Rod	Tube
Copper.....	68.63			68.82
Brass, 70/30.....	56.80	57.14		59.51
Brass, Low.....	61.35	61.89	61.29	64.16
Brass, R L.....	63.07	63.61	63.01	65.88
Brass, Naval.....	59.80	60.08	54.11	62.98
Muntz Metal.....	57.84	51.85	53.65	
Comm. Br.....	65.33	65.87	65.37	67.89
Mang. Br.....	63.54	66.19	67.64	
Phos. Br. 5%.....	86.79	84.44	87.29	

## TITANIUM

(10,000 lb base, f.o.b. mfr)

Sheet and strip, commercially pure, \$12.16-  
\$12.60; alloy, \$15.00-\$15.75; Plate, HR, com-  
mercially pure, \$10.00-\$10.50; alloy, \$11.50-  
\$12.00. Wire, rolled and/or drawn, commer-  
cially pure, \$9.00-\$11.50; alloy, \$11.50; Bar, HR  
or forged, commercially pure, \$7.55-\$7.80; alloy,  
\$7.55-\$7.75.

## PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed.....	35.90
Aluminum pig.....	24.00
Antimony, American, Laredo, Tex.....	32.50
Beryllium copper, per lb cont'd Be.....	\$43.00
Beryllium aluminum 5% Be, Dollars per lb contained Be.....	\$74.75
Bismuth, ton lots.....	\$ 2.25
Cadmium, del'd.....	\$ 1.70
Cobalt, 97-99% (per lb).....	\$2.60 to \$2.67
Copper, electro, Conn. Valley.....	45.00
Copper, Lake, delivered.....	46.00
Gold, U. S. Treas., per troy oz.....	\$35.00
Indium, 99.9% dollars per troy oz.....	\$ 2.35
Iridium, dollars per troy oz.....	\$100 to \$120
Lead, St. Louis.....	15.80
Lead, New York.....	16.00
Magnesium, 99.8+%, f.o.b. Velsco, Tex., 10,000 lb, pig.....	35.75
Ingot.....	34.50
Magnesium, sticks, 100 to 500 lb.....	56.00
Mercury, dollars per 74-lb flask, f.o.b. New York.....	\$255 to \$257
Nickel electro.....	64.50
Nickel oxide sinter at Copper Cliff, Ont., contained nickel.....	60.75
Palladium, dollars per troy oz.....	\$25 to \$24
Platinum, dollars per troy oz.....	\$103 to \$105
Silver, New York, cents per troy oz.....	90.125
Tin, New York.....	96.25*
Titanium sponge, grade A-1.....	\$2.70 to \$3.00
Zinc, East St. Louis.....	13.60
Zinc, New York.....	14.00
Zirconium sponge.....	\$10.00

\*Tentative

## REMELTED METALS

### Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot.....	35.50
No. 115.....	34.25
No. 120.....	34.25
No. 123.....	33.25
80-10-10 ingot.....	38.75
No. 305.....	37.00
No. 315.....	37.00
85-10-5 ingot.....	50.25
No. 210.....	46.50
No. 215.....	46.50
No. 245.....	41.50
Yellow ingot.....	38.75
No. 405.....	31.25
Manganese bronze.....	
No. 421.....	

### Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys.....	26.00-26.75
0.30 copper max.....	25.75-26.50
0.50 copper max.....	25.50-26.00
Piston alloys (No. 122 type).....	24.25-25.00
No. 12 alum. (No. 2 grade).....	24.50-25.00
108 alloy.....	26.00-26.75
195 alloy.....	26.00-26.75
13 alloy (0.60 copper max.).....	24.50-25.00
AXS-679.....	

## Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97%.....	24.00-25.00
Grade 2—92-95%.....	23.25-24.25
Grade 3—90-92%.....	22.50-23.25
Grade 4—85-90%.....	22.00-22.50

## SCRAP METALS

### Brass Mill Scrap

(Cents per pound, add 1¢ per lb for  
shipments of 20,000 lb and over)

	Heavy	Turnings
Copper.....	42	41 1/4
Yellow brass.....	31 1/4	29
Red brass.....	37	36 1/4
Comm. bronze.....	38 1/4	37 1/4
Mang. bronze.....	28 1/4	28 1/4
Yellow brass rod ends.....	31	

### Custom Smelters Scrap

(Cents per pound carload lots, delivered  
to refinery)

No. 1 copper wire.....	31 1/4
No. 2 copper wire.....	30
Light copper.....	27 1/2
*Refinery brass.....	23
*Dry copper content.....	

### Ingot Makers Scrap

(Cents per pound carload lots, delivered  
to refinery)

No. 1 copper wire.....	31 1/4
No. 2 copper wire.....	30
Light copper.....	27 1/2
No. 1 composition.....	27
No. 1 comp. turnings.....	26 1/4
Hvy. yellow brass solids.....	18 1/4
Brass pipe.....	18 1/4
Radiators.....	21

### Aluminum

Mixed old cast.....	15 — 14
Mixed new clips.....	16 1/2 — 17 1/2
Mixed turnings, dry.....	16 — 17

### Dealers' Scrap

(Dealers' buying price, f.o.b. New York  
in cents per pound)

### Copper and Brass

No. 1 copper wire.....	29 — 29 1/2
No. 2 copper wire.....	26 1/2 — 27
Light copper.....	24 — 24 1/2
Auto radiators (unsweated).....	17 1/2 — 18
No. 1 composition.....	23 1/2 — 24
No. 1 comp. turnings.....	22 1/2 — 23
Unlined red car boxes.....	18 1/2 — 19 1/2
Cocks and faucets.....	19 — 19 1/2
Clean heavy yellow brass.....	16 — 16 1/2
Brass pipe.....	21 — 21 1/2
New soft brass clippings.....	22 1/2 — 23
No. 1 brass rod turnings.....	20 — 20 1/2

### Aluminum

Alum. pistons and struts.....	7 — 7 1/2
Aluminum crankcases.....	12 — 12 1/2
1100 (28) aluminum clippings.....	15 1/2 — 16
Old sheet and utensils.....	12 — 12 1/2
Borings and turnings.....	8 1/2 — 9
Industrial castings.....	12 — 12 1/2
2024 (24S) clippings.....	13 1/2 — 14

### Zinc

New zinc clippings.....	7 1/2 — 8
Old zinc.....	4 1/2 — 5
Zinc routings.....	2 1/2 — 3
Old die cast scrap.....	2 1/2 — 2 3/4

### Nickel and Monel

Pure nickel clippings.....	\$1.65-\$1.90
Pure nickel turnings.....	\$1.50
Nickel anodes.....	\$1.65-\$1.90
Nickel rod ends.....	\$1.65-\$1.90
New Monel clippings.....	60-70
Clean Monel turnings.....	60-70
Old sheet Monel.....	65-75
Nickel silver clippings, mixed.....	21
Nickel silver turnings, mixed.....	18

### Lead

Soft scrap lead.....	12 1/2 — 13
Battery plates (dry).....	7 — 7 1/2
Batteries, acid free.....	4 1/2

### Miscellaneous

Block tin.....	80 — 81
No. 1 pewter.....	40 1/2 — 41
Auto babbitt.....	40 — 41
Mixed common babbitt.....	13 — 13 1/2
Solder joints.....	18 — 18 1/2
siphon tops.....	
Small foundry type.....	15 1/2 — 15 1/2
Monotype.....	14 1/2 — 15
Lino. and stereotype.....	13 — 13 1/2
Electrotype.....	12 1/2 — 12 1/2
Hand picked type shells.....	10 — 10 1/2
Lino. and stereo. dross.....	5 1/4 — 5 1/2
Electro. dross.....	4 1/4 — 4 1/2



IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.												
STEEL PRICES		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
(Effective July 10, 1956)		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			\$96.00 B3		4.65 B3	6.80 B3	4.65 B3						
	Buffalo, N. Y.	\$68.50 B3	\$84.50 R3, B3	\$96.00 R3, B3	5.45 B3	4.65 B3	6.80 B3	4.65 B3	4.325 R3, B3	6.25 B3 6.25 R7, S10	6.825 B3	9.10 B3		
	Claymont, Del.													
	Harrison, N. J.													13.45 C11
	Canshohocken, Pa.								4.775 A2	6.70 A2	6.825 A2			
	New Bedford, Mass.									6.70 R6				
	Johnstown, Pa.	\$68.50 B3	\$84.50 B3	\$96.00 B3		4.65 B3	6.80 B3							
	Boston, Mass.									6.80 T8				13.80 T8
	New Haven, Conn.									7.30 D1 6.70 A5				
	Phoenixville, Pa.					5.15 P2		5.15 P2						
	Sparrows Pt., Md.								4.325 B3	6.25 B3	6.425 B3	9.10 B3		
	Bridgeport, Wallingford, Conn.	\$73.50 N8	\$89.50 N8						4.625 N8	6.70 W1			7.50 N8	
	Pawtucket, R. I. Worcester, Mass.									6.80 N7 A5				A5 13.80 N7
MIDDLE WEST	Alton, Ill.								4.50 L1					
	Ashland, Ky.								4.325 A7					
	Canton-Massillon, Dover, Ohio		\$86.50 R3	\$96.00 R3										13.45 G4
	Chicago, Ill.	\$68.50 U1	\$84.50 R3, U1 89.50 W8	\$96.00 R3, U1 \$101.00 W8	5.45 U1	4.60 U1, 4.85 W8	6.75 U1, Y1	4.60 U1	4.55 A1 4.575 W8 4.325 N4	6.35 A1, T8			7.45 W8	13.45 T8
	Cleveland, Ohio									6.25 A5, J3		9.30 A5		13.45 A5
	Detroit, Mich.			\$96.00 R5					4.425 G3, M2	6.35 D2, G3, M2, P11 6.95 D1	6.525 G3	9.20 D2, G3		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	\$68.50 U1	\$84.50 U1	\$96.00 U1, Y1	6.45 J3	4.60 U1 J3	6.75 U1, J3		4.325 J3, U1, Y1	6.35 J3 6.25 Y1	6.425 J3, U1, Y1	9.30 Y1	7.20 Y1, U1	
	Sterling, Ill.								4.425 N4					
	Indianapolis, Ind.									6.40 C5				
	Newport, Ky.												7.20 N5	
	Middletown, Ohio									6.45 A7				
	Niles, Warren, Ohio Sharon, Pa.		\$94.50 C10	\$106.00 C10					4.325 S1, R3	6.25 S1, R3, T4	6.425 S1, R3	9.10 S1, R3	7.20 S1	13.45 S1
WEST	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$68.50 U1, J3	\$84.50 J3, U1, C11	\$96.00 U1, C11	5.45 U1	4.60 U1, J3	6.75 U1, J3	4.60 U1	4.325 P6	6.25 S7, B4			7.20 S9	13.45 S9
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					4.60 W3			4.325 W3	6.25 F3, W3	6.425 W3	9.10 W3		
	Youngstown, Ohio			\$96.00 Y1, C10			6.75 Y1		4.325 U1, Y1	6.25 Y1, C5	6.425 U1, Y1	9.30 Y1	7.20 U1, Y1	13.45 C5
	Fontana, Cal.	\$78.00 K1	\$94.00 K1	\$117.00 K1		5.30 K1	7.40 K1	5.45 K1	5.125 K1	8.90 K1	7.575 K1		8.95 K1	
	Geneva, Utah		\$84.50 C7			4.60 C7	6.75 C7							
	Kansas City, Mo.					4.70 S2	6.85 S2				6.675 S2		7.45 S2	
	Los Angeles, Torrance, Cal.		\$94.00 B2	\$116.00 B2		5.30 C7, B2	7.45 B2		5.875 C7 B2	8.30 C1			8.40 B2	
	Minnequa, Colo.					4.90 C6			5.425 C6					
	Portland, Ore.					5.35 O2								
	San Francisco, Niles, Pittsburg, Cal.		\$94.00 B2			5.25 B2, P9	7.40 B2		5.875 B2, C7					
	Seattle, Wash.		\$95.00 B2			5.35 B2	7.50 B2		5.325 B2					
	SOUTH	Atlanta, Ga.								4.525 A8				
Fairfield, Ala. City, Birmingham, Ala.		\$68.50 T2	\$84.50 T2			5.10 C16 4.60 R3, T2	6.75 T2		4.325 R3, T2 4.825 C10		6.425 T2			
Houston, Lone Star, Texas		\$74.50 L3	\$89.50 S2	\$101.00 S2		4.70 S2	6.85 S2				6.675 S2		7.45 S2	



IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.										
STEEL PRICES (Effective July 10, 1956)		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Flat Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem				5.575 B3	7.425 B3	6.90 B3					
	Buffalo, N. Y.	4.65 B3,R3	4.65 B3,R3	6.30 B5	5.575 B3,R3	7.425 B3,B5	6.90 B3	4.50 B3,R3				6.60 W6
	Claymont, Del.							5.35 C4		6.30 C4	6.725 C4	
	Coatesville, Pa.							4.80 L4		6.30 L4	6.725 L4	
	Conshohocken, Pa.							4.95 A2	6.025		7.175 A2	
	Harrisburg, Pa.							5.10 P2	5.575 C3			
	Hartford, Conn.			6.75 R3		7.725 R3						
	Johnstown, Pa.	4.65 B3	4.65 B3		5.575 B3		6.90 B3	4.50 B3		6.30 B3	6.725 B3	6.60 B3
	Fairless, Pa.	4.80 U1	4.80 U1		5.725 U1							
	Newark, N. J.			6.70 W10		7.60 W10						
	Camden, N. J.			6.70 P10								
	Bridgeport, Putnam, Conn.	4.80 N8		6.90 W10	5.725 N8			4.750 N8				
	Sparrows Pt., Md.		4.65 B3					4.50 B3		6.30 B3	6.725 B3	6.70 B3
MIDDLE WEST	Palmer, Worcester, Roadville, Mass. Milton, Pa.	5.25 M7	5.25 M7	6.70 W11 6.45 C14 6.70 B5		7.725 A5,B5		4.50 R3				6.90 A5 6.90 W6
	Spring City, Pa.			6.35 K4		7.60 K4						
	Alton, Ill.	4.85 L1										6.775 L1
	Ashland, Newport, Ky.							4.50 A7,N5		6.30 N5		
	Canton-Massillon, Mansfield, Ohio	4.75 R3		6.25 R2,R3	5.575 R3,T5	7.425 R2,R3,T5		4.50 E7				
	Chicago, Joliet, Ill.	4.65 U1, R3, 4.90 W8 5.15 P13	4.65 N4,R3, 5.15 P13	6.25 B5,W10, A5,L2 6.50 W8	5.575 U1,R3, 5.825 W8	7.425 A5, W10,L2,B5 7.675 W8		4.50 U1, J3,R3 4.725 A1 4.75 W8	5.575 U1	6.30 U1	6.725 U1	6.60 A5,R3, N4,W7
	Cleveland, Ohio	4.65 R3	4.65 R3	6.25 A5,C13		7.425 A5,C13	6.90 R3	4.60 J3,R3	5.575 J3		6.725 R3,J3	6.60 A5, C13
	Detroit, Mich.	4.75 G3	4.75 G3	5.90 R5 6.45 B5 6.50 P3 6.10 P6	5.575 R5 5.875 G3	7.425 R5 7.625 B5,P3, P6	6.90 G3	4.60 G3			6.825 G3	
	Duluth, Minn.											6.60 A5
	Gary, Ind. Harbor, Crawfordsville	4.65 J3, U1, Y1	4.65 J3, U1, Y1	6.25 M5,R3	5.575 J3, U1, Y1	7.425 M5, R3	6.90 U1, J3, Y1	4.50 J3, U1, Y1	5.575 J3	6.30 U1, Y1	6.725 U1, J3, Y1	6.35 M4
	Granite City, Ill.							4.70 C2				
	Kokomo, Ind.											7.20 C9
	Sterling, Ill.	4.75 N4	4.75 N4									6.70 N4
WEST	Niles, Warren, Ohio Sharon, Pa.	4.65 R3,C10		6.25 C10	6.25 C10	7.425 C10	6.90 R3	4.50 S1,R3		6.30 S1	6.725 S1	
	Pittsburgh, Pa. Midland, Pa.	4.65 J3, U1, C11	4.65 J3, U1	6.25 A5,C8, C11,J3, W10,B4,R3	5.575 U1,C11	7.425 A5,C11, W10,C8,R3	6.90 J3, U1	4.50 J3, U1	5.575 U1	6.30 U1	6.725 J3, U1	6.60 A5,J3, P6
	Portsmouth, Ohio											6.60 P7
	Weirton, Wheeling, Follansbee, W. Va.	4.65 W3						4.50 W3,W5				
	Youngstown, Ohio	4.65 U1, Y1, C10,R3	4.65 U1, Y1, R3	6.25 Y1, U1	5.575 U1, Y1, C10	7.425 Y1,C10, F2	6.90 U1, Y1	4.50 U1, Y1, R3		6.30 Y1	6.725 Y1	6.60 Y1
	Emeryville, Cal.	5.40 J5	5.40 J5									
	Fontana, Cal.	5.35 K1	5.35 K1		6.625 K1		7.50 K1	5.20 K1		7.00 K1	7.375 K1	
	Geneva, Utah							4.50 C7			6.725 C7	
	Kansas City, Mo.	4.90 S2	4.90 S2		5.825 S2		7.85 S2					6.85 S2
	Los Angeles, Torrance, Cal.	5.35 B2,C7	5.35 B2,C7	7.70 R3	6.625 B2		7.50 B2				7.625 B2	7.55 B2
	Minnequa, Colo.	5.10 C6	5.10 C6					5.35 C6				6.85 C6
	Portland, Ore.	5.40 O2	5.40 O2									
	SOUTH	San Francisco, Niles, Pittsburg, Cal.	5.35 C7 5.40 B2,P9	5.35 C7 5.40 B2,P9				7.55 B2				
Seattle, Wash.		5.40 B2,P12, N6	5.40 B2,P12				7.55 B2	5.40 B2		7.30 B2	7.625 B2	
Atlanta, Ga.		5.15 A8	5.15 A8									6.90 A8
	Fairfield, Ala. City, Birmingham, Ala.	4.65 T2,R3 5.15 C16	4.65 T2,R3 5.15 C16				6.80 T2	4.50 T2,R3			6.725 T2	6.60 R3,T2
	Houston, Ft. Worth, Lone Star, Tex.	4.90 S2	4.90 S2		5.825 S2		7.85 S2	4.85 L3 4.80 S2		6.40 S2	6.825 S2	6.85 S2

# Steel Prices (Effective July 10, 1956)

## Key to Steel Producers

With Principal Offices

- A1 Acme Steel Co., Chicago  
A2 Alan Wood Steel Co., Canonsburg, Pa.  
A3 Allegheny Ludlum Steel Corp., Pittsburgh  
A4 American Clad Metals Co., Carnegie, Pa.  
A5 American Steel & Wire Div., Cleveland  
A6 Angell Nail & Chaplet Co., Cleveland  
A7 Armco Steel Corp., Middletown, Ohio  
A8 Atlantic Steel Co., Atlanta, Ga.  
B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.  
B2 Bethlehem Pacific Coast Steel Corp., San Francisco  
B3 Bethlehem Steel Co., Bethlehem, Pa.  
B4 Blair Strip Steel Co., New Castle, Pa.  
B5 Bliss & Laughlin, Inc., Harvey, Ill.  
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.  
C1 Calstrip Steel Corp., Los Angeles  
C2 Carpenter Steel Co., Reading, Pa.  
C3 Central Iron & Steel Co., Harrisburg, Pa.  
C4 Claymont Products Dept., Claymont, Del.  
C5 Cold Metal Products Co., Youngstown, O.  
C6 Colorado Fuel & Iron Corp., Denver  
C7 Columbia Geneva Steel Div., San Francisco  
C8 Columbia Steel & Shifting Co., Pittsburgh  
C9 Continental Steel Corp., Kokomo, Ind.  
C10 Copperweld Steel Co., Pittsburgh, Pa.  
C11 Crucible Steel Co. of America, Pittsburgh  
C12 Cumberland Steel Co., Cumberland, Md.  
C13 Cuyahoga Steel & Wire Co., Cleveland  
C14 Compressed Steel Shifting Co., Readville, Mass.  
C15 G. O. Carlson, Inc., Thorndale, Pa.  
C16 Connors Steel Div., Birmingham  
C17 Chester Blast Furnace, Inc., Chester, Pa.  
D1 Detroit Steel Corp., Detroit  
D2 Detroit Tube & Steel Div., Detroit  
D3 Driver Harris Co., Harrison, N. J.  
D4 Dickson Weatherproof Nail Co., Evanston, Ill.  
D5 Henry Dorton & Sons, Inc., Philadelphia  
E1 Eastern Stainless Steel Corp., Baltimore  
E2 Empire Steel Co., Mansfield, O.  
F1 Fifth Sterling, Inc., McKeesport, Pa.  
F2 Fitzsimmons Steel Corp., Youngstown  
F3 Follansbee Steel Corp., Follansbee, W. Va.  
G1 Globe Iron Co., Jackson, O.

- G2 Granite City Steel Co., Granite City, Ill.  
G3 Great Lakes Steel Corp., Detroit  
G4 Greer Steel Co., Dover, O.  
H1 Hanna Furnace Corp., Detroit  
I1 Ingersoll Steel Div., Chicago  
I2 Inland Steel Co., Chicago  
I4 Interlake Iron Corp., Cleveland  
J1 Jackson Iron & Steel Co., Jackson, O.  
J2 Jessop Steel Corp., Washington, Pa.  
J3 Jones & Laughlin Steel Corp., Pittsburgh  
J4 Joslyn Mfg. & Supply Co., Chicago  
J5 Judson Steel Corp., Emoryville, Calif.  
K1 Kaiser Steel Corp., Fontana, Cal.  
K2 Keystone Steel & Wire Co., Peoria  
K3 Koppers Co., Granite City, Ill.  
K4 Keystone Drawn Steel Co., Spring City, Pa.  
L1 Laclede Steel Co., St. Louis  
L2 La Salle Steel Co., Chicago  
L3 Lone Star Steel Co., Dallas  
L4 Lukens Steel Co., Coatesville, Pa.  
M1 Mahoning Valley Steel Co., Niles, O.  
M2 McLouth Steel Corp., Detroit  
M3 Mercer Tube & Mfg. Co., Sharon, Pa.  
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.  
M5 Monarch Steel Div., Hammond, Ind.  
M6 Mystic Iron Works, Everett, Mass.  
M7 Milton Steel Products Div., Milton, Pa.  
N1 National Supply Co., Pittsburgh  
N2 National Tube Div., Pittsburgh  
N3 Niles Rolling Mill Div., Niles, O.  
N4 Northwestern Steel & Wire Co., Sterling, Ill.  
N5 Newport Steel Corp., Newport, Ky.  
N6 Northwest Steel Rolling Mills, Seattle  
N7 Newman Crosby Steel Co., Pawtucket, R. I.  
N8 Northeastern Steel Corp., Bridgeport, Conn.  
O1 Oliver Iron & Steel Co., Pittsburgh  
O2 Oregon Steel Mills, Portland  
P1 Page Steel & Wire Div., Monessen, Pa.  
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.  
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.  
P4 Pittsburgh Coke & Chemical Co., Pittsburgh  
P5 Pittsburgh Screw & Bolt Co., Pittsburgh  
P6 Pittsburgh Steel Co., Pittsburgh  
P7 Portsmouth Div., Detroit Steel Corp., Detroit  
P8 Plymouth Steel Co., Detroit

- P9 Pacific States Steel Co., Niles, Cal.  
P10 Precision Drawn Steel Co., Camden, N. J.  
P11 Production Steel Strip Corp., Detroit  
P12 Pacific Steel Rolling Mills, Seattle  
P13 Phoenix Mfg. Co., Joliet, Ill.  
R1 Reeves Steel & Mfg. Co., Dover, O.  
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.  
R3 Republic Steel Corp., Cleveland  
R4 Roebbing Sons Co., John A., Trenton, N. J.  
R5 Rotary Electric Steel Co., Detroit  
R6 Rodney Metals, Inc., New Bedford, Mass.  
R7 Rome Strip Steel Co., Rome, N. Y.  
S1 Sharon Steel Corp., Sharon, Pa.  
S2 Sheffield Steel Corp., Kansas City  
S3 Shenango Furnace Co., Pittsburgh  
S4 Simonds Saw and Steel Co., Fitchburg, Mass.  
S5 Sweet's Steel Co., Williamsport, Pa.  
S6 Standard Forging Corp., Chicago  
S7 Stanley Works, New Britain, Conn.  
S8 Superior Drawn Steel Co., Monaca, Pa.  
S9 Superior Steel Corp., Carnegie, Pa.  
S10 Seneca Steel Service, Buffalo  
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.  
T2 Tennessee Coal & Iron Div., Fairfield  
T3 Tennessee Products & Chem. Corp., Nashville  
T4 Thomas Strip Div., Warren, O.  
T5 Timken Steel & Tube Div., Canton, O.  
T6 Tremont Nail Co., Warcham, Mass.  
T7 Texas Steel Co., Fort Worth  
T8 Thompson Wire Co., Boston  
U1 United States Steel Corp., Pittsburgh  
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.  
U3 Ulbrich Stainless Steels, Wallingford, Conn.  
U4 U. S. Pipe & Foundry Co., Birmingham  
W1 Wallingford Steel Co., Wallingford, Conn.  
W2 Washington Steel Corp., Washington, Pa.  
W3 Weirton Steel Co., Weirton, W. Va.  
W4 Wheatland Tube Co., Wheatland, Pa.  
W5 Wheeling Steel Corp., Wheeling, W. Va.  
W6 Wickwire Spencer Steel Div., Buffalo  
W7 Wilson Steel & Wire Co., Chicago  
W8 Wisconsin Steel Co., S. Chicago, Ill.  
W9 Woodward Iron Co., Woodward, Ala.  
W10 Wyckoff Steel Co., Pittsburgh  
W11 Worcester Pressed Steel Co., Worcester, Mass.  
W12 Wallace Barnes Steel Div., Bristol, Conn.  
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

## PIPE AND TUBING

Base discounts (pct) f.a.b. mills. Base price about \$280 per net ton.

	BUTTWELD												SEAMLESS											
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2 In.		3 In.		3 1/2-4 In.			
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
<b>STANDARD T. &amp; C.</b>																								
Sparrows Pt. B3.....	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75										
Youngstown R3.....	18.50	1.25	21.50	5.25	24.00	8.75	26.50	10.00	27.00	11.00	27.50	11.50	29.00	11.75										
Fontana K1.....	6.00	13.25	9.00	+9.25	11.50	+5.75	14.00	+4.00	14.50	+3.00	15.00	+2.50	16.50	+1.75										
Pittsburgh J3.....	18.50	1.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25		
Alton, Ill. L1.....	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75										
Sharon M3.....	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75										
Fairless N2.....	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75										
Pittsburgh N1.....	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25		
Wheeling W5.....	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75										
Wheatland H4.....	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75										
Youngstown Y1.....	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25		
Indiana Harbor Y1.....	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.00	26.00	11.50	26.50	12.00	28.00	11.75										
Lorain N2.....	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25		
<b>EXTRA STRONG PLAIN ENDS</b>																								
Sparrows Pt. B3.....	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75										
Youngstown R3.....	23.00	7.25	27.00	11.25	29.00	14.75	29.50	14.00	30.00	15.00	30.50	15.50	31.00	14.75										
Fairless N2.....	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75										
Fontana K1.....	10.50		14.50		16.50		17.00		17.50		18.00		18.50											
Pittsburgh J3.....	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75		
Alton, Ill. L1.....	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75										
Sharon M3.....	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75										
Pittsburgh N1.....	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75		
Wheeling W5.....	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75										
Wheatland H4.....	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75										
Youngstown Y1.....	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75		
Indiana Harbor Y1.....	22.00	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75										
Lorain N2.....	21.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75		

Threads only, butt-weld and seamless 2 1/2 pt. higher discount. Plain ends, butt-weld and seamless, 3-in. and under, 5 1/2 pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt., e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.



(Effective July 10, 1956)

To identify producers, see Key on preceding page

## TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	\$1.60	T-1
18	4	1	—	—	2.305	T-4
18	4	2	—	—	1.765	T-9
1.5	4	1.5	8	—	.96	M-1
6	4	3	8	—	1.35	M-3
6	4	3	8	—	1.105	M-2

High-carbon chromium... .77 D-8, D-5  
Oil hardened manganese... .42 O-3  
Special carbon... .39 W-1  
Extra carbon... .33 W-1  
Regular carbon... .275 W-1  
Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

## CLAD STEEL

Base prices, cents per lb. l.a.b.

Cladding	Plate (A3, J2, L4)			Sheet (J2)	
	10 pct	15 pct	20 pct	20 pct	
304.....	30.30	33.15	36.05	32.50	
316.....	35.50	38.45	41.40	47.00	
321.....	32.00	34.85	37.75	37.25	
347.....	34.40	37.90	41.40	48.25	
405.....	25.80	29.60	33.35		
410, 430.....	25.30	29.10	32.85		

CR Strip (89) Copper, 10 pct, 2 sides, 42.15; 1 side, 33.40.

## WARE-HOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery Charge	Sheets		Strip		Plates		Shapes		Bars		Alloy Bars	
		Hot-Rolled	Cold-Rolled	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled	Cold-Finished	Hot-Rolled	Cold-Drawn	Cold-Drawn
Baltimore.....	\$ .10	7.31	8.32	8.37	7.45	7.63	7.93	7.61	8.62	14.38	13.44	16.29	16.49
Birmingham.....	.15	6.90	7.93	8.85	7.06	6.99	7.28	7.08	8.35		13.96	16.49	
Boston.....	.10	7.63	8.50	7.71	7.95	7.95	7.93	7.77	9.96		13.76	16.81	
Buffalo.....	.15	8.22	9.17	10.42	8.31	8.51	8.37	8.37	9.96				
Chicago.....	.15	7.35	8.40	10.16	7.50	7.80	7.75	7.50	8.05		13.65	16.70	
Cincinnati.....	.15	7.28	8.39	9.25	7.36	7.60	7.58	7.42	7.90		13.30	16.35	
Cleveland.....	.15	7.40	8.38	9.25	7.60	7.89	8.05	7.66	8.30	13.50	13.55	16.44	16.60
Columbus.....	.15	7.28	8.39	9.10	7.46	7.77	7.91	7.48	8.15	13.41	13.36	16.26	16.41
Dallas.....	.15	8.60	10.76	11.22	8.90	8.60	8.75	8.90	9.82			17.97	
Detroit.....	.15	7.47	8.58	9.53	7.64	7.88	8.05	7.70	8.19	13.70	13.54	16.55	16.50
Houston.....	.15	7.85	8.75	10.40	8.15	8.00	8.20	8.25	10.10	14.35	15.90	17.15	17.05
Kansas City.....	.20	7.47	8.76	9.17	7.73	7.66	7.95	7.75	8.52	13.87	13.52	16.72	16.57
Los Angeles.....	.10	8.25	10.10	11.10	8.60	8.85	8.40	8.25	11.00		14.50	18.10	
Memphis.....	.10	7.12	8.25		7.38	7.31	7.60	7.40	9.15				
Milwaukee.....	.15	7.37	8.48	9.34	7.45	7.69	7.75	7.51	8.09		13.39	16.44	
New Orleans.....	.15	7.20	8.35		7.45	7.40	7.70	7.50	9.55				
New York.....	.10	7.68	8.98	9.73	8.33	8.31	8.21	8.26	9.07		13.67	16.72	
Norfolk.....	.20	7.25			7.65	7.45	7.95	7.65	9.50				
Philadelphia.....	.10	7.44	8.54	9.51	8.09	7.82	7.85	7.83	8.62		13.45	16.50	
Pittsburgh.....	.15	7.28	8.39	9.55	7.46	7.60	7.58	7.42	8.15	13.85	13.30	16.25	16.35
Portland.....	.15	7.80	8.80	10.65	8.06	7.95	7.75	7.85	9.15		15.00	17.50	
Salt Lake City.....	.20	8.60	10.15		9.35		9.20	9.15					
San Francisco.....	.10	8.30	9.75	10.25	8.45	8.40	8.35	8.25	11.55		14.50	18.10	
Seattle.....	.00	8.75	10.50	10.90	8.90	8.50	8.50	8.60	12.25		14.75	17.80	
St. Louis.....	.15	7.57	8.68	9.54	7.65	7.89	7.98	7.71	8.44		13.50	16.64	
St. Paul.....	.25	7.94	8.59	9.89	7.72	7.65	7.94	7.74	8.51		13.51	16.31	

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 999 lb. All others: 2000 to 999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions: (\*) 1500 to 999 lb. (\*) 1000 lb or over. (\*) \$.25 delivery. (\*) 1000 to 999 lb. \$.25 delivery.

\*Plus analysis charge. †Deduct for country delivery.

## ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
		Semi-Processed	Fully Processed
Field.....	8.40	8.60	
Armature.....	9.35	9.60	10.10
Elect.....	9.95	10.20	10.70
Motor.....	10.95	11.20	11.70
Dynamo.....	11.85	12.10	12.60
Trans. 72.....	12.80	13.05	13.55
Trans. 65.....	13.35		Grain Oriented
Trans. 58.....	13.85		Trans. 80..... 17.45
Trans. 52.....	14.85		Trans. 73..... 17.95

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (N3); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanesville (A7).

\* Coils 75¢ higher.

## LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1956 season. Freight charges for seller's account.

	Gross Ton
Openhearth lump.....	\$12.10
Old range, bessemer.....	11.85
Old range, nonbessemer.....	11.10
Menabi, bessemer.....	11.00
Menabi, nonbessemer.....	10.86
High phosphorus.....	10.88

## MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails		Wire Fence		Single Loop Bale Ties		Galv. Barbed and Twisted Barbed Wire		Merch. Wire Anode		Merch. Wire Cath.	
	Cal	Cal	Cal	Cal	Cal	Cal	d/lb.	d/lb.	d/lb.	d/lb.	d/lb.	d/lb.
Alabama City R3.....	152	162			173	175	7.40	7.80				
Aliquippa, Pa. J3.....	152	162					7.40	7.80				
Atlanta A8.....	154	167			177	180	7.40	8.125				
Bartonsville K2.....	154	163			175	181	7.60	8.20				
Buffalo W6.....	152	166			175	179	7.50	8.10				
Chicago, Ill. N4.....	157						7.50					
Cleveland A6.....	157						7.40					
Cleveland A5.....	152	162			175	175	7.50	7.90				
Crawfordsville M4.....	154	168			177	181	7.40	8.20				
Decora, Pa. A5.....	152	162			175	175	7.50	7.90				
Duluth A5.....	152	162			175	175	7.50	7.90				
Fairfield, Ala. T2.....	152	162			175	175	7.50	7.90				
Galveston D4.....	157											
Houston S2.....	157	170			180	180	7.65	8.05				
Johnstown, Pa. B3.....	152	166			175	175	7.40	7.80				
Juliet, Ill. A5.....	152	162			175	175	7.50	8.10				
Kokomo, Ind. C9.....	160	180			195	193	8.10	8.50				
Los Angeles B2.....							8.35	8.825				
Kansas City S2.....	157	167			178	180	7.45	8.05				
Minneapolis C5.....	157	167			180	180	7.45	8.05				
Minneapolis P6.....	152	162					7.40	7.80				
Moline, Ill. R3.....	162	163					8.00					
Pittsburg, Cal. C7.....	171	185			199	195	8.45	8.85				
Portsmouth P7.....							8.00					
Rankin, Pa. A5.....	152	162			175	175	7.40	7.90				
Sa. Chicago R3.....	152	162	157		173	175	7.45	7.80				
S. San Francisco C6.....	154				175	181	7.60	8.20				
Spartan, Pa. B3.....	154				175	181	7.60	8.20				
Struthers, O. Y1.....	150						7.50	8.00				
Worcester A5.....	150						7.70	8.20				
Williamsport, Pa. S3.....		180										

Galvanized products computed with zinc at 5¢ per lb. Exceptions: \*zinc at 12.5¢ per lb; \*\* 13¢ zinc.

## C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bristol, Conn. W12.....			10.90	13.05	15.75
Buffalo, N. Y. R7.....	7.00	8.95	10.50	12.65	15.35
Carnegie, Pa. S9.....		9.85	10.60	12.75	15.35
Cleveland A5.....	7.10	9.05	10.60	12.75	15.45
Detroit D1.....	7.20	9.15	10.70	12.85	
Detroit D2.....	7.20	9.15	10.70	12.85	
Harrison, N. J. C11.....	7.10	9.05	10.60	12.75	15.75
Indianapolis C5.....	7.15	9.10	10.50	12.65	15.35
New Castle, Pa. B4.....	7.00	8.95	10.50	12.65	
New Haven, Conn. D1.....	7.55	9.35	10.90	13.05	
Pawtucket, R. I. N7.....	7.65	9.35	10.90	13.05	15.75
Pittsburgh S7.....	7.10	9.05	10.60	12.75	15.45
Riverdale, Ill. A1.....	7.20	9.05	10.60	12.75	15.45
Sharon, Pa. S1.....	7.10	9.05	10.60	12.75	15.45
Tranton R4.....					
Wallingford W1.....	7.55	9.35	10.90	13.05	15.75
Warren, Ohio T4.....	7.00	8.95	10.50	12.65	15.35
Weirton, W. Va. W3.....	7.10	8.95	10.50	12.65	
Worcester, Mass. A5.....	7.65	9.35	10.90	13.05	15.75
Youngstown C5.....	7.00	8.95	10.50	12.65	15.35

## BOILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox.....	3	13	32.09	37.37	29.93	
	2 1/2	12	43.22	50.31	40.31	
	3	12	49.90	58.10	46.55	
	3 1/2	11	58.26	67.83	54.34	
	4	10	77.36	90.67	72.17	
National Tube.....	2	13	32.09	37.37	29.93	
	2 1/2	12	43.22	50.31	40.31	
	3	12	49.90	58.10	46.55	
	3 1/2	11	58.26	67.83	54.34	
	4	10	77.36	90.67	72.17	
Pittsburgh Steel.....	2	13	32.09	37.37	29.93	
	2 1/2	12	43.22	50.31	40.31	
	3	12	49.90	58.10	46.55	
	3 1/2	11	58.26	67.83	54.34	
	4	10	77.36	90.67	72.17	

## RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Unthreaded
Bessemer U.I.	4.725	5.65	5.825	8.05	8.05	5.625	5.625
So. Chicago R3	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Ensley T2	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Fairfield T2	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Gary U.I.	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Ind. Harbor T3	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Ind. Harbor Y1	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Johnstown R3	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Juliet U.I.	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Kansas City S2	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Lackawanna R3	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Lohansen R3	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Minnequa C6	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Pittsburgh O1	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Pittsburgh P3	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Pittsburgh J3	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Seattle B2	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Steelton B3	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Struthers Y1	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Torrance C7	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Williamsport S3	4.725	5.65	5.825	8.05	8.05	5.625	5.625
Youngstown R3	4.725	5.65	5.825	8.05	8.05	5.625	5.625

## COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connelleville, Pa.	\$14.50
Foundry, beehive (f.o.b. oven)	
Connelleville, Pa.	\$17.00 to \$18.00
Foundry, oven coke	
Buffalo, del'd	\$28.75
Chicago, f.o.b.	27.00
Detroit, f.o.b.	27.50
New England, del'd	28.55
Seaboard, N. J., f.o.b.	26.75
Philadelphia, f.o.b.	36.50
Swedeland, Pa., f.o.b.	26.50
Painesville, Ohio, f.o.b.	27.50
Erie, Pa., f.o.b.	27.50
Cleveland, del'd	29.48
Cincinnati, del'd	28.59
St. Paul, f.o.b.	26.50
St. Louis, f.o.b.	28.50
Birmingham, f.o.b.	26.65
Lone Star, Tex., f.o.b.	19.50

## ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	23.00	40	100, 110	9.90
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	10.95
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	90	10.10
10	60	24.25	17	72	10.35
7	60	24.50	14	72	10.35
6	60	27.25	12	60	11.75
4	48	30.25	10	60	11.90
3	48	32.00	8	60	12.10
2 1/2	30	33.75			
2	24	52.50			

\* Prices shown cover carbon nipples.

## ELECTROPLATING SUPPLIES

## Anodes

(Cents per lb, f.o.b. shipping point)

Copper	
Cast elliptical, 18 in. or longer,	
5000 lb lots	64.48
Electrodeposited	56.78
Brass, 80-20, ball anodes, 2000 lb	
or more	60.00
Zinc, ball anodes, 2000 lb lots	21.25
(for elliptical add 2¢ per lb)	
Nickel, 90 pct plus, rolled carbon	90.50
(rolled depolarized add 3¢ per lb)	
Cadmium	21.70
Tin, ball anodes and elliptical	\$1.00 to \$1.10

## Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	82.50
Copper sulphate, 5 or more 100 lb	
bags, per cwt	21.15
Nickel salts, single, 4-100 lb bags	32.25
Nickel chloride, freight allowed,	
200 lbs	43.50
Sodium cyanide, domestic, f.o.b. N. Y.	
200 lb drums	21.55
(Philadelphia price 21.80)	
Zinc cyanide, 100 to 900 lb	55.55
Potassium cyanide, 100 lb drum	
N. Y.	48.00
Chromic acid, flake type, 1 to 30	
100 lb drums	30.25

## BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

## Machine and Carriage Bolt

	Discounts	Full Full case	case 20,000 lb.	Quantity or more
1/2 in. & smaller x 6 in. & shorter	61	63		
Larger than 1/2 in. diam. and all diam. longer than 6 in.	55	57		
Roller thread carriage bolts 1/2 in. & smaller x 6 in. and shorter	61	63		
Lag, all diam. x 6 in. & shorter	61	63		
Lag, all diam. longer than 6 in.	55	57		
Plow bolts	61	63		

## Nuts, Hex, HP, reg. &amp; hvy.

1/2" or smaller	64	66
3/4" to 1 1/4" inclusive	63	65
1 1/2" to 1 3/4" inclusive	65	67
1 3/4" and larger	61	63

## C.P. Hex, regular &amp; hvy.

1/2" or smaller	64	66
3/4" and larger	61	63

## Hot Galv. Nuts (all types)

1 1/2" or smaller	44	47
-------------------	----	----

## Finished, Semi-finished, Hex Nuts

1/2" and smaller	65	66
3/4" and larger	63	63
Add 25% for less than case or keg quantity.		

## Rivets

	Base per 100 lb	Pot Off List
1/2 in. and larger	\$9.95	
7/16 in. and smaller	\$2	

## Cap Screws

	Discount	H.C. Heat
Bright Treated		
New std. hex head, pack-aged		
1/4" thru 1/2" diam. x 6" and shorter	34	20
9/16" and 5/8" x 6" and smaller and shorter	31	16
3/4", 1" x 6" and shorter	9	+11
New std. hex head, bulk		
1/4" thru 1/2" diam. x 6" and shorter	49	41
9/16" and 5/8" diam. x 6" and shorter	43	39
3/4", 1" x 6" and shorter	31	20
* Minimum quantity per item:		
15,000 pieces 1/4", 5/16", 3/8" diam.		
5,000 pieces 7/16", 1/2", 9/16", 5/8" diam.		
2,000 pieces 3/4", 1" diam.		

## Machine Screws &amp; Stove Bolts

	Discount	Mach. Screws	Stove Bolts
Packaged, package list	27	38	
Bulk, bulk list			
Quantity			
1/2-in. diam. & under	25,000-200,000	20	61
5/16-in. diam. & larger	15,000-100,000	20	61
All diam. over 3 in. long	5,000-100,000	—	61

## Machine Screw &amp; Stove Bolt Nuts

		Discount	
		Hex	Square
Packaged, package list . . .		24	27
Bulk, bulk list			
Quantity			
%-in. diam. & smaller	25,000-200,000	18	20

## CAST IRON WATER PIPE INDEX

Birmingham	113.1
New York	125.6
Chicago	127.5
San Francisco-L.A.	134.8

Dec. 1955 value, Class B or heavier 4 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.

## REFRACTORIES

Fire Clay Brick	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00)	\$122.00
No. 1 Ohio	
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	18.00

## Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$128.00
Childs, Hays, Pa.	138.00
Chicago District	138.00
Western Utah	144.00
California	151.00

## Super Duty

Hays, Pa., Athens, Tex., Wind-ham, Warren, O.	145.00
Curtner, Calif.	163.00
Silica cement, net ton, bulk, East-ern (except Hays, Pa.)	21.00
Silica cement, net ton, bulk, Hays, Pa.	24.00
Silica cement, net ton, bulk, Chi-cago District, Ensley, Ala.	22.00
Silica cement, net ton, bulk, Utah and Calif.	22.00

## Chrome Brick

Standard chemically bonded, Balt.	\$91.00
Standards chemically bonded, Curt-ner, Calif.	101.25
Burned, Balt.	85.00

## Magnesite Brick

Standard Baltimore	\$114.00
Chemically bonded, Baltimore	102.00

## Grain Magnesite

Domestic, f.o.b. Baltimore	St. 1/2-in. grains
in bulk fines removed	\$64.00
Domestic, f.o.b. Chewahall, Wash., Luning, Nev.	
in bulk	40.00
in sacks	46.00

## Dead Burned Dolomite

P.o.b. bulk, producing points in:	Per net ton
Pa., W. Va., Ohio	\$15.00
Midwest	15.00
Missouri Valley	14.00

## METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron e.l.f.	
New York, ocean bags	9.50¢
Canadian sponge iron,	
Del'd in East, carloads	9.5¢
Domestic sponge iron, 98+%	
Fe, carload lots	9.5¢
Electrolytic iron, annealed,	
imported 99.5+ % Fe	27.5¢
domestic 99.5+ % Fe	35.5¢
Electrolytic iron, unannealed	
minus 325 mesh, 99+ % Fe	57.0¢
Electrolytic iron melting	
stock, 99.84% pure	22.0¢
Carbonyl iron also 5 to 10	
micron, 98%, 00.8+ % Fe.	\$8.0¢ to \$1.55
Aluminum freight allowed.	35.00¢
Brass, 10 ton lots	\$7.50¢ to \$0.00¢
Copper, electrolytic	59.50¢
Copper, reduced	59.50¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic 99.95%	
min. Fe .03 max. Del'd.	\$5.00
Lead	8.90¢ plus metal value
Manganese	70.0¢
Molybdenum, 99%	\$3.00 to \$3.25
Nickel, unannealed	\$1.00
Nickel, annealed	\$1.00
Nickel, spherical, unannealed,	
#80	\$1.18
Silicon	43.50¢
Solder powder, .70¢ to 9.0¢ plus met. value	
Stainless steel, 302	99.0¢
Stainless steel, 316	\$1.32
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	\$4.50
Zinc, 10 ton lots	\$8.75¢ to \$2.50¢

## WELDCO Pickling Crates

With the New Pierced-

Type Cross Members

Offer Bigger Payloads—

Longer Service Life



• These six Weldco pickling crates, made of Monel, are now in use in a Gary, Indiana, sheet mill. Sturdy and long-lasting, they're pickling sheet steel in a 5 to 10% sulphuric acid bath at 160° to 180° F. An extra feature of these Monel crates is the new, pierced-type cross member, with these cost-cutting advantages:

1. Greater strength—more tonnage per load.

2. Less hole distortion or enlargement. The taper pins remain tight—do not become loose or wobble.

3. Less time needed for loading, as less time required for placing pins, due to tapered hole.

4. Only a small surface is exposed to attack by acid. Cross member retains its strength longer, and there are fewer replacements.

Why not find out how these long-lasting Weldco crates can improve your pickling operations? Write or phone today for complete details and descriptive literature.

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4701 Rhawn St., Holmesburg, Philadelphia 36, Pa.

ESTABLISHED 1909



# Ferroalloy Prices

(Effective July 10, 1956)

## Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk carloads, del'd, 67-71% Cr, 30-1.00% max. Si.			
0.025% C	32.25	0.20% C	36.25
0.03% C	32.75	0.50% C	36.00
0.06% C	37.25	1.00% C	35.25
0.10% C	36.75	1.50% C	35.10
0.15% C	36.50	2.00% C	35.00
4.00-4.50% C, 67.70% Cr, 1-2% Si	26.25		
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si	25.00		
0.025% C (Simplex)	32.50		
0.10% C, 50-52% Cr, 2% max Si	33.75		
8.50% max. C, 50-55% Cr, 3-6% Si	22.50		
8.50% C, 50-55% Cr, 3% max Si	22.50		

## High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% of N.

## Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.	
0.10% max. C	\$1.27
0.50% max. C	1.27
9 to 11% C, 33-91% Cr, 0.75% Fe	1.36

## Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (1/4" thick) delivered packed, 99.80% min. Cr (Metallic Base) Fe 0.20 max.	
Carloads	1.25
Ton lots	1.27
Less ton lots	1.29

## Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.	
Carloads	41.35
Ton lots	46.15
Less ton lots	46.65

## Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.	
30-33% Cr, 60-65% Si, 3.00 max. Fe.	
Carloads	23.00
Ton lots	25.25
Less ton lots	26.75

## Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	23.05
Ton lots	24.95
Less ton lots	25.95

## SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr. 20% Fe 1/2 in. x 12 mesh.	
Ton lots	19.65
Less ton lots	20.90

## V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.	
Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

## Graphidex No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11% Ca 5 to 7%.	
Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

## Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	
Marietta, Ashabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	10.75
Johnstown, Pa.	10.75
Sheridan, Pa.	10.75
Philo, Ohio	10.75
S. Duquesne	10.75
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, 66 pct Mn:	
Carloads, bulk	13.00
Ton lots packed	15.20

## Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.	
Manganese	
16 to 19% Si	3% max. \$92.00
19 to 21% Si	3% max. 94.00
21 to 23% Si	3% max. 96.50

## Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed	45.75
Ton lots	47.25

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads	31.5
Ton lots	33.5
250 to 1999 lb	35.5
Premium for hydrogen-removed metal	0.75

## Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn...	
	22.85

## Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.	
Carloads Ton Less	
0.07% max. C, 0.06% P, 90% Mn	34.00 36.55 37.75
0.07% max. C	31.95 34.50 35.70
0.10% max. C	31.20 33.75 34.95
0.15% max. C	30.45 33.00 34.20
0.30% max. C	28.95 31.50 32.70
0.50% max. C	28.45 31.00 32.20
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	25.45 28.00 29.20

## Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.	
Carload bulk	12.00
Ton lots	13.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	13.55
Ton lots, packed	15.75

## Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$160.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.	
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## Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.	
Ton Lots Carloads	
96.50% Si, 2% Fe	22.75 21.45
98% Si, 1% Fe	23.25 21.95

## Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si. briquets.	
Carloads, bulk	7.15
Ton lots, packed	9.75

## Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.	
50% Si	12.75 75% Si 15.40
65% Si	14.50 85% Si 17.10
	90% Si 18.50

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Ton lots	\$2.05
Less ton lots	2.40
	Turnings Distilled \$2.95 \$3.75 3.30 4.55

## Ferrovanadium

50-55% V contract basis, delivered, per pound, contained V, carloads, packed.	
Openhearth	3.10
Crucible	3.20
High speed steel (Primos)	3.30

Alsilfer, 20% Al, 40% Si, 40% Fe. Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langloeth, Pa., per pound Contained Mo

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	\$6.90
Less ton lots	6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb cont Sb plus Ta

Ferrromolybdenum, 55-75%, 200-lb containers, f.o.b. Langloeth, Pa., per pound contained Mo

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton

10 tons to less carload	\$90.00
	\$110.00

Ferrotitanium, 40% regular grade, 0.10% C max, f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

Ferrotitanium, 25% low carbon, 0.10% C max, f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

Less ton lots	\$1.50
	\$1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton

Ferrotungsten, 1/4 x down, packed, per pound contained W, ton lots, delivered

Molybde oxide, briquets, per lb contained Mo, f.o.b. Langloeth, Pa.

bags, f.o.b. Washington, Pa. Langloeth, Pa.	\$1.32
	\$1.30

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb. Carload, bulk lump

Ton lots, packed lump	17.50¢
Less ton lots	19.50¢
	20.00¢

Vanadium oxide, 86-89% V<sub>2</sub>O<sub>5</sub> contract basis, per pound contained V<sub>2</sub>O<sub>5</sub>

Zirconium contract basis, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	26.25¢
12-15%, del'd lump, bulk-carloads	8.50¢

## Boron Agents

Borasil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3.14%, Si 40-45%, per lb contained B

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%

f.o.b. Suspension Bridge, N. Y., freight allowed

Ton lots per pound

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots

f.o.b. Wash., Pa.; Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 18% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1	\$1.05
No. 79	50¢

Manganese - Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	\$1.48
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots





W. F. MUNFORD

Portrait by Fabian Bachrach

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## THE CLEARING HOUSE

### News of Used and Rebuilt Machinery

**Still Good . . .** Despite arrival of the hot weather and uncertainty about steel production in view of the strike, sales of used equipment in the **Delaware Valley** area are continuing at a brisk pace.

A 2-day auction sale conducted at the Eddystone, Pa., plant of the Baldwin-Lima-Hamilton Corp. offers evidence of this high level of activity. As part of a move to consolidate production facilities, B-L-H decided to dispose of its surplus equipment, including a number of heavy machine tools.

About 500 people attended the sale and purchasers of the equipment represented virtually all sections of the U. S. as well as Puerto Rico. Amid spirited interest over 1000 items were sold.

**Summer Slump? . . .** Used machinery dealers in the area report, in similar optimism, that business is good. Factors that could be slowing sales—hot weather, vacations, and the steel strike—don't

seem, as yet, to be influencing trade in the used and rebuilt machine tool field.

There was a slowdown in May after an unusually good first quarter. However, business picked up in the latter half of June and the upsurge continued on into this month. Apparently, despite the present economic storm clouds, buyers are confident it's only a brief summer squall.

**New Team . . .** In addition to Mr. Lucas, new president of the Machinery Dealers National Association, (pictured below), other officers were announced by the group at its Chicago convention.

They include: Charles Kempler (Interstate Machinery Co., Chicago), 1st vice president; Arnold Borgman (J. L. Lucas & Son, Inc., Bridgeport, Conn.), 2nd vice president; Elmer W. Pfeil (Elmer W. Pfeil, Inc., Cleveland), treasurer; and R. K. Vinson of Washington, D. C., continues as executive director of the group.



R. A. VINE has been honored by the Machinery Dealers National Association for his years of service to the group. He was president of the organization for 2 years and has served as a member of the board of directors for the past 14 years. He is president of R. A. Vine, Inc.



AUSTIN D. LUCAS is the new president of the Machinery Dealers National Association. He heads Austin D. Lucas & Co., Inc., which he organized in 1940. Within MDNA, he has served as treasurer, member of the board of directors and chairman of the New York-New England chapter.

# CONSIDER GOOD USED EQUIPMENT FIRST

## BENDER

#500 Wallace Hydr. Bender; 180". Can'y 2 1/2"

## BENDING ROLLS

6" x 2 1/2" Niagara, Initial Type  
6" x 3/4" Webb Bal., Initial Type  
16" x 10 Ga. Bortach, Initial Type  
12" x 3/4" Cleveland Pyramid Type  
16" x 3/4" Niles Pyramid Type  
27" x 1" Southwest Pyramid Type

## BRACKS—LEAF TYPE

10" x 16 Ga. Dreis & Krump Hand Operated  
12" x 3/4" Dreis & Krump, Motor Driven  
12" x 3/4" Dreis & Krump, Motor Driven

## BRAKE—PRESS TYPE

10" x 3/4" Superior Hydraulic

## CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H 29' Span 230 Volt D.C.  
5 ton Shepard Niles 45' Span 220/440 A.C.  
5 ton Shepard Niles 55' Span 220 Volt D.C.  
5 ton P&H 80' Span 220/2/60 A.C.  
5 ton Cleveland 98' Span 230 Volt D.C.  
10 ton Cyclops 49' Span 220/440 A.C.  
10 ton P&H 77' Span 230 Volt D.C.  
10 ton Milwaukee 80' Span 230 Volt D.C.  
10 ton P&H 86' Span 220 Volt D.C.  
50 ton Hand Oper. 100' Span  
120 ton Whiting 80' Span 220/3/60 A.C.

## CUT OFF MACHINES

Yoder AD-2 Cut-off, Max. Capacity 3/4" O.D.  
Yoder Type L Flying Cut-off, Cap'y 3/4" to 3" Tubing

## FORGING MACHINES

2" Ajax, Air 4" Acme, Ajax, National

## HAMMERS BOARD DROP—STEAM DROP

STEAM FORGING—600 lb. to 20,000 lb.

## LATHES—TURRET

#2A Warner & Swasey Univ. Type M 510 Preselector

## Head, LATE.

## LEVELLERS—ROLLER

60" United 17 Rolls 3 1/2" Dia.  
72" McKay 17 Rolls 4 1/2" Dia.  
72" McKay 17 Rolls 2 1/2" Dia. Backed-up  
84" McKay 17 Rolls 4 1/2" Dia.  
MULTI SLIDE MACHINE  
No. 35 U. S. Multi Slide Machine

## NO. 3 MEDART THREE ROLL ROTARY STRAIGHTENER CAPACITY 1" to 4" DIAMETER PIPE OR TUBING

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500 ton Clearing H-1500-40, 24" Stroke, Bed 36x42"  
600 ton Southward 16" Stroke, Bed 60x74"  
750 ton Elmes, 54" Stroke, Platen 30 1/2"x38"  
800 ton Clearing, 48" Stroke, Bed 48x68"  
1000 ton Lake Erie Dble Acting, 46" Strokes, Bed  
Arms & Platen 72" x 148"

## PRESS—STRAIGHT SIDE

Clearing Model TF41500-290 Triple Acting Strokes  
40, 32, 14", Bed Area 100" x 200"

## PUNCH & SHEAR COMBINATIONS

Style B.F. Cleveland 36" Throat, Punch 1 1/2" thru 1"  
Style W. Cleveland 60" Throat, Punch 1 1/2" thru 1"  
Pels LUNEFF, Punch 1 1/2" x 1", Shear Angles 6 x  
6 x 3/4", Rd. 2 1/2", Sq. 2 1/2", etc.

## ROLLING MILLS

10" x 16" Single Stand, Two High  
12" x 16" Phila. Single Stand, Two High  
12" x 20" Standard Single Stand, Two High  
15" x 22" Farrel Single Stand, Two High  
15" x 30" G & M Single Stand, Two High

16" x 24" Farrel Two Stand, Two High  
22" x 12" x 40" Lewis 3-High Sheet Mill  
12" Three High Bar Mill  
20" x 54" United Single Stand, Two High  
8" Torrington Ring Type Reversing Mill  
For cold reducing 7" wide strip

## ROLLS FORMING

8 Stand Maplewood, Spindle 2" Dia., 12" Dist. between spindles

## SHEARS—GATE

80" x 3/4" Pels  
88" x 1" Hillis & Jones

## SHEAR—ANGLE

6 x 6 x 3/4" Cleveland

## SHEARS—SQUARING

10" x 3/4" Cincinnati, LATE  
12" x 3/16" Niagara SL-12  
12" x 3/4" Steelwell

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36" Yoder Slitting Line  
G-48 Yoder Gang Slitter, 5" Threaded Arbor

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Kane & Roach 2 Roll Rotary Straightener, M.D.  
Capacity Mildsteel 1/4" to 3/4"  
Kane & Roach 5 Roll #5250-B, Capacity 3/4" to 2 1/2"  
solid, 4 1/2" Tube  
Acting Standard 12 Roll Straightener, Capacity 2"

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2 1/2" A. Fern, Capacity 2 1/2" Tube, 3 1/2" Solid 10"  
Die Length, Hydraulic Feed, LATE

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72" Hanchett 3-sp. rot. surface, new 1946.  
13" x 60" Model 300 Hanchett vert. spdl., late.  
14" x 36" Pratt & Whitney hyd. vert. surface, 1942.  
No. 72AS Head hyd. pl. internal, extended bridge,  
1943.  
No. 74 Head hyd. pl. internal, X-sliding M. S., 1941.  
12" x 24" Cincinnati ER hyd. universal cyl. serial  
203B1H-5.  
14" x 36" Landis type C hyd. pl. cylindrical, 1942.  
6" x 30" Cincinnati EA Filmatix pl. cylindrical, 1942.

### HAMMERS

No. 6-1 Hazel, pneumatic, late.  
No. 5N Hazel, self-contained.  
No. 6B Hazel, self-contained.

### LATHES

No. 3 Gisholt Univ. Turret Lathes (2), 1942.  
14" x 6" Hendey Toolroom, 1940.  
15" x 30" Lipe Carbo-Matic, 1942.  
24" x 20" bed Lodge & Shipley engine lathe, 10 HP  
Drive.  
125" x 90" CC Niles Bement Pond engine lathe, 80 HP  
M.D.

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36" Rockford Hyd. Openside Shaper-Planer.  
42" x 42" x 12" Liberty dsl. housing planer, 35 HP  
M.D.  
48" x 48" x 10" Gray Maxi-Service.

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30 ton No. 925/C Toledo D.C. Str. Side.  
280 ton No. 795/5-72 Toledo D.C. Tcgle drawing.  
500 ton No. 1039 Hamilton D.C. adj. bed, 60" x 162".  
2000 ton No. 6 National Maxipress Forging Press.

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24" Gould & Eberhardt Universal.  
32" G & E Invinible, F.M.D., late type.  
36" Rockford openside hyd. shaper-planer, ser.  
39HUS.  
36" Rockford hyd. vertical slotter, new 1944.

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Qu.	KW	Make	R.P.M.	D.C. Volts	A.C. Volts
1	2500	Whase.	720	600	4160/2300
1	2000	Al. Ch.	720	250	4160/2300
1	1200	Whase.	720	600	2300
1	1120	Elliot	720	260/280	2300
1	500	G.E.	1200	250	2300/440
1	500	Ch. Wh.	720	575/600	2300/440
1	300	G.E.	1200	250/275	2300
1	200	Elliot	1200	125	4000/2300
1	150	G.E.	1200	250	2300/440
1	120	Whase.	1200	250	2300/440
1	100	Al. Ch.	720	250	4000/2300

### DIRECT CURRENT MOTORS

Qu.	H.P.	Make	Type	Volts	R.P.M.
2	3000	Whase.	Mill	525	600
6	1500	Whase.	Mill	525	600
4	750	Whase.	Mill	250	300/700
2	600	Al. Ch.	Mill	600	300/600
2	600	Whase.	Mill	230	110/230
2	500	Whase.	Mill	250	285/716
1	450	Whase.	RS	230	450/600
1	350	G.E.	CD-169	230	1150
1	300	Whase.	Mill	230	300
4	275	Whase.	QM	230	435/850
1	200/250	Ed. Dy.	Fed. Brg.	230	490/1200
1	200	Whase.	SK-210	230	400/800
1	180	G.E.	MPC	230	400
1	150	Whase.	SK-201	230	300/900
1	125	Whase.	SK-194	230	575/850
1	125	G.E.	MPC	230	400/600
1	100	Ed. Dy.	30-S	230	450/1350
2	100	Ed. Dy.	30-S	230	475/950
1	80	Reliance	651-T	230	575/1150
1	60/80	Ed. Dy.	25S	230	525/1150
1	40	G.E.	CD-123	230	500/1000
1	40	Whase.	SK-140	230	500/1700
1	32 1/2	Whase.	SK-150	230	400/1200
2	25	Whase.	SK-93	230	1800
1	20	Cr. Wh.	D.P.B.B.	230	1150/2400
1	20	Whase.	SK-123	230	400/1200
1	15	G.E.	CD-85	230	575/2300
2	15	Whase.	SK-100L	230	500/1500
1	15	Reliance	155-T	230	400/1600
1	10	Whase.	SK-103	230	400/1600
1	10	Al. Ch.	W-125	230	300/1200
4	10	Whase.	SK-91	230	250/1050
1	7 1/2	G.E.	CD-75	230	690/2070
1	7 1/2	G.E.	CD-85	230	450/1350
4	5 1/2	Reliance	T.E.F.C.	230	337/1350

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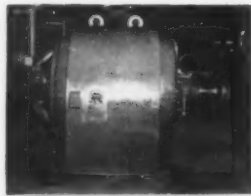
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 48" Cleveland COMBINATION ROLLER LEVELLER & CUT TO LENGTH SHEAR, 48" x 1/16" Capacity, up to 120" Long Sheets.  
 15 TON ALLIANCE CRANE TROLLEY, 8' Trolley Span, 30' Lift, Cast Steel Frame, 230 Volts DC, Photo on Request.

96" x 96" x 24" NILES PLANNER, 2 Rail Heads and 1 Side Head, with Reversing DC Motor & Control, Photograph on Request.  
 24" HEAVY DUTY CINCINNATI SHAPER, Universal Table, 8 Speeds from 9 to 119 inches/min, 18 HP Motor, Modern Very Good Condition.  
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 250 TON TOLEDO STRAIGHT SIDE PRESS NO. 59A, 31" x 32" Bed, 12" Stroke, 19" Shut Height, 40 HP Motor.  
 10" PORTABLE ALLIGATOR SHEAR, 1 1/2" Capacity, 10 HP Motor, Very Low Price.  
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 10 TON SHEPARD NILES ELECTRIC HOIST, 230 Volts DC, 10' Lift.  
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 1000 KW GENERAL ELECTRIC ROTARY CONVERTER, Type MCC, 230 Volts DC, with 2300 Volt Transformers & Switchgear, Ideal for Shop Supply.  
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 1-600 H.P. 2300 Volt 600 RPM GE Vert Sq. Cage  
 1-400 H.P. 2300 Volt 1775 RPM GE Induction  
 1-350 H.P. 440 Volt 3600 RPM GE Class I Group D  
 1-300 H.P. 2200 Volt 1775 RPM GE Induction  
 2-250 H.P. 2300 Volt 1775 RPM GE Ind. TEFC  
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 3-75 H.P. 230 Volt 900 RPM Crocker-Wheeler

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 2-400 KW 250 Volt 750 RPM GE  
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 1-100 KW 600 Volt 1200 RPM W'hoose  
 1-150 KW 120 Volt 1200 RPM Elliott  
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 2-GM 8-567 400 KW 250 Volt DC  
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 5-GM 3-208A 100 KW 120-240 Volt DC 1200 RPM  
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 3-GM 6-71 60 KW 110/220 Volt AC 1200 RPM  
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 Approx. 1000' Powered Roller Conveyor, rolls 11" dia. x 72" width.  
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3 phase—60 cycle

Qu.	H.P.	Make	Type	Volts	Speed
1	1500	G.E.	MT	4900	1197
1	1100	G.E.	1M	2300	720
1	1000	A.C.	MIII	2300	240
1	800	G.E.	MT	2300	380
1	750	G.E.	MT-573	2300	1190
1	700	A.C.		2300	600
1	500	Whase.	CW	550	850
1	400	Whase.	CW-900A	440	1170
1	400	Whase.	CW	410	514
1	400	Whase.	CW-1213	2200	485
1	350	G.E.	IM-17A	440/2200	720
1	250	G.E.	MT-424Y	4000	357
1	250	G.E.	MT-559S	2200	1800
1	250	Al. Ch.		550	600
1	200	Cr. Wh.	20QB	440	565
1	200	G.E.	1M	410	435
1	200	G.E.	1M	2200	580
1	150 (unused)	Whase.	CW	2300	435
2	125	A.C.		410	865
1	125	Al. Ch.		440	720
1	100	G.E.	IM-18	2200	435
1	100	G.E.	1M	440	600
4	100	A.C.	ANY	440	695

### SQUIRREL CAGE

1	800	G.E.	KT-573	2200	1180
2	650	G.E.	PT-559BY	440	8570
2	450	Whase.	CR-1420	2300/4150	350
1	400	TE-15B		2200	1165
1	400	G.E.	1K	2200	600
1	200	G.E.	KT-17	440	580
3	200	G.E.	KT-557	440	1500
1	150/75	G.E.	1K	440/900	480
1	150	Whase.	CR-856B	440	860
1	150	Whase.	CR	440	580
3	125	Al. Ch.	ARW	2200	1750

### SYNCHRONOUS

Qu.	H.P.	Make	Type	Volts	RPM
1	7000	G.E.	ATI	2300/6600	600
1	4350	C.W.	3501/81400/6900/13500	514	
1	2850	Whase.	.8 p.f.	2300/4000	814
1	2000	Whase.	.8 p.f.	2200	720
3	2000	Whase.		2300	120
2	1750	G.E.	ATI	2300	8600
1	735	G.E.	ATI	2200/12000	600
3	400	G.E.	TS-7567	2300	1200
1	450	Whase.		2200	124.5
1	450	Whase.		2200	450
1	400	G.E.	TS-7565	2200	1200
1	325	G.E.	ATI	440	1800
1	225	G.E.	ATI	440	1800

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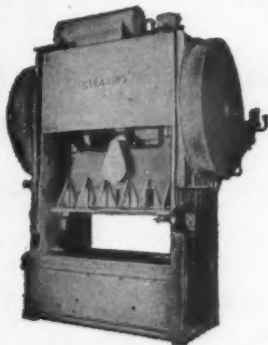
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1200	*AL. Ch.	ARW	1200
750	*Westg.	CS	900
500	*AL. Ch.	ARW	3600
500	*G.E.	KT-5698	900
500	*G.E.	KT-424	450
450	*AL. Ch.	ARW	1800
400	*G.E.	KT-424	720
300	*G.E.	KT-6353 TEFEC	720
250	*Westg.	CS-TEFC	1800
250	*G.E.	KT-559	1800
250	*L.-Allis.	CEX-148	720
250	*G.E.	IK	600
250	*G.E.	IK-17A	600
250	*Westg.	CR-14	514
200	*G.E.	FT-549Y	3600
200	*G.E.	IK-13B	1800
200	*AL. Ch.	AR	720
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Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39



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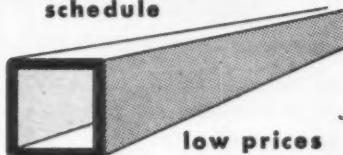
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STAINLESS PIPE & FITTINGS

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### More Protection For Defense

With the steel strike in its second week, Commerce Dept. took another step to protect defense contractors. It ordered mills still operating to set aside a larger proportion of their production for defense purposes. Commerce said the share of steel earmarked for defense would be upped by about 200 pct in the average steel plant.

### Steel Peace Moves

Federal mediators are hopeful that steel company and union representatives can be brought together late this week to resume contract negotiations. Since the walkout started on July 1, no formal negotiating sessions have been held.

### Mediators Search for "The Facts"

Federal Mediation and Conciliation Service, stepping up its efforts to help bring a settlement in the steel strike, had its personnel boning up on steelmaking statistics. The federal strike solvers lined up in particular number of man hours it takes to make a ton of steel and effect of each dollar of wage increases on tonnage costs.

### Farms Threatened Too

Farm spokesmen told Congress the strike threatened the entire 1956 cotton crop because of lack of bale ties. Cotton must be baled as it is ginned, if losses are to be avoided. American Farm Bureau says the shortage is critical, warns that cotton income, as well as the investment in the 1956 crop, is in danger of going down the drain without bale ties.

### Employment Up, But Headed Down

Just before the steel strike left a wake of unemployed throughout the nation, employment hit an all-time high. Labor and Commerce Depts. announced June employment was over 66.5 million for the first time, a full 2.5 million more job holders than a year ago. Most industries, except automotive, showed significant employment gains over a year ago.

### Scrap Tariff Suspension Extended

Congress is extending for another year the suspension of import duties on most types of metal scrap, including iron and steel, nickel and nickel alloys, brass, aluminum and magnesium. The House tried to include tungsten but the Senate disagreed.

### Another Price Increase

For the first time since August, 1954, Hubbard & Co., manufacturer of pole line hardware and electrical construction specialties, has boosted prices.

## ADVERTISERS

An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturer for your copies today.

<b>A</b>		Electric Controller & Manufacturing Co., Division Square D Co. 54
A-I Steel Co. ....	150	Electric Equipment Co. .... 151
*Acheson Colloids Co. ....	115	Electro-Manganese Division, Foote Mineral Co. .... 96
Aetna-Standard Engineering Co., The ....	87	Enterprise Galvanizing Co. .... 155
*Alan Wood Steel Co. ....	50	Erie Bolt & Nut Co. .... 108
Allis-Chalmers Mfg. Co. ....	14 & 15	Espen-Lucas Machine Works, The 155
Alloy Steel Casting Co. ....	157	*Euclid Crane & Hoist Co., The. 122
Amco Co. ....	151-152	Everyready .... 150-151
American Chemical Paint Co. ..	90	
*American Manganese Bronze Co. 145		<b>F</b>
American Steel & Wire Div., United States Steel Corp. ....	17	Fabrikant Steel Products, Inc. .. 153
American Welding & Mfg. Co., The ....	54	Falk Machinery Co. .... 149
Armel, James P. ....	150	Federal Machine & Welder Co. .. 22
*Armstrong Bros. Tool Co. ....	155	*Federal Press Co., The .... 119
		Fenway Machine Company, Inc. .... 111
		Foster, Frank B., Inc. .... 152
		Frank, M. K. .... 151
<b>B</b>		
*Baker & Company, Inc. ....	123	
*Baker Industrial Truck Div. of The Baker-Kaulang Co. ....	10	<b>G</b>
Belyea Co., Inc. ....	150	Garrett, Geo. K., Co., Inc. .... 9
Bennett Machinery Co. ....	149	*Gerrard Steel Strapping Div., U. S. Steel Corp. .... 25
Bethlehem Steel Co. ....	1	Goodman Electric Machinery Co. .... 150
Blaw-Knox Company Foundry & Mill Machinery Division 112 & 113		Goss & DeLew Machine Co. .. 155
*Bliss, E. W., Co., Rolling Mill Div. 47		Greenpoint Iron & Pipe Co., Inc. 151
Brazos Engineering Co. ....	150	Grieder Industries, Inc. .... 92
*Bridgeport Brass Co. ....	60	Griffin Manufacturing Co. .... 155
Browning, Victor R. & Co., Inc. 155		Grove, Don S. .... 153
*Bullard Co., The ....	49	
		<b>H</b>
<b>C</b>		Hanna Furnace Corp., The .... 44
Canton Drop Forging & Mfg. Co., The ....	155	Hannifin Corp. .... 124
Carborundum Co., Abrasive Div. Between Pages 44 & 45		Harbison Walker Refractories Co. 70
Chambersburg Engineering Co. ..	157	Harrison Sheet Steel Co. .... 155
*Chase Brass & Copper Co., Inc. 137		Heat and Power Co., Inc. .... 152
Chicago Electric Co. ....	151	Hendrick Manufacturing Co. .... 104
*Cincinnati Milling Machine Co., The ....	52	Henry, A. T., & Company, Inc. .... 149
*Cincinnati Shaper Co., The 102 & 103		*Hewitt-Robins Incorporated 20 & 21
Colorado Fuel & Iron Corp., The Wickwire Spencer Steel Div. ..	98	*Homestead Valve Manufacturing Co. .... 23
Columbia-Geneva Steel Div., United States Steel Corp. ....	17	*Hoskins Manufacturing Co. Inside Front Cover
*Columbus McKinnon Chain Corporation ....	88	Hughes, Arnold Co. .... 151-152-153
Consolidated Electrodynamics Corporation, Rochester Division ..	97	Hydraulic Press Mfg. Co., The Metal Working Division .... 12
Continental Foundry & Machine Co., Division Blaw-Knox Co. 112 & 113		Hyman, Joseph, & Sons .... 151
Crawford, F. H., & Co., Inc. ....	149	
*Crucible Steel Co. of America 58		<b>I</b>
		Ingersoll-Rand Co. .... 106 & 107
<b>D</b>		Ingersoll Steel Division Borg-Warner Corp. .... 111
Davidson Pipe Co., Inc. ....	153	Inland Steel Co. .... 28
Donahue Steel Products Co., Inc. 149		Iron & Steel Products, Inc. .... 148
Dony, D. E., Machinery Co. ....	151	Israel Corp. of America .... 153
*Dow Chemical Co. ....		Ivins, Ellwood Steel Tube Wks., Inc. .... 155
Between Pages 126 & 127		
		<b>J</b>
<b>E</b>		Jennings, Jira Thayer .... 54
Eastern Machine Screw Corp., The 123		Jones & Laughlin Steel Corp. .... 30
Eastern Machinery Co., The ....	152	

## IN THIS ISSUE

<b>K</b>	
Kasle Steel Corp. ....	151
Kinderman, Lou F. ....	150

<b>L</b>	
Lamson & Sessions Co., The ....	100
Lang Machinery Co. ....	151
Leeds & Northrup Co. ....	26
*Lees-Bradner Co., The ....	43
Lukens Steel Co. ....	133
Luria Bros. & Co., Inc. ....	135

<b>M</b>	
MacCabe, T. B., Co. ....	149
Martin, Joe, Inc. ....	153
*Master Lock Company ....	127
*May-Fran Engineering, Inc. 120 & 121	
Meriwether, Geo. M. ....	151
*Metal Carbides Corp. ....	105
Metalwash Machinery Corp. ....	154
Michigan Steel Tube Products Company ....	125
Miles Machinery Co. ....	149
*Monsanto Chemical Co., Organic Chemicals Division ...	16
Morrison Railway Supply Co. ....	153

<b>N</b>	
*National Broach & Machine Co. ....	65
National Business Bourse, Inc. ....	154
National Machinery Exchange ...	152
National Steel Corp. ....41 & 64	
National Tube Div., United States Steel Corp. ....	17
New York & New Jersey Lubricant Company ....	104
*North Carolina Department of Conservation & Development ...	13
*Northern Engineering Works ...	62

<b>O</b>	
Ornitz Equip. Corp. ....	152
Osborn Mfg. Co., The ....	5
Ovingsteel, Inc. ....	46
*Owen Bucket Co., The ....	145

<b>P</b>	
*Pangborn Corp. Inside Back Cover	
*Penn Precision Products, Inc. ....	11
Picker X-Ray Corporation ....	44
Pillet Scrap Iron & Metal, Inc. ....	153
*Pittsburgh Engineering & Machine Co. ....	95
Platt Bros. & Co., The ....	155
Pratt & Whitney Co., Inc. ....	109
Price Bros. Co. ....	152

<b>R</b>	
Rail & Industrial Equip. Co., Inc. ....	151
*Red Seal Metals Co. ....	122
*Republic Steel Corp. ....18 & 19	
*Reynolds Metals Co. ....	47
Railway Bearing Co., Inc. ....	27

Ruthman Machinery Co., The ...	126
Ryerson, Jos. T., & Son, Inc. ....	6

<b>S</b>	
SKF Industries, Inc. ....	
Between Pages 16 & 17	
*Sandvik Steel, Inc. ....	91
*Sealube Company, The ....	111
Service Steel, Div., Van Pelt Corp. ....	155
Sharon Steel Corp. ....	8
Snyder Tool & Engineering Co. ....	68 & 69
Socany Mobil Oil Co., Inc. ....	4
Square D Company, E C & M Division ....	56
*Standard Conveyor Company ....	66
*Standard Pressed Steel Co. ....	
Between Pages 44 & 45	
Stanhope, R. C., Inc. ....	153
Steel Shot Producers, Inc. ....	99
Struthers Wells Corporation, Titusville Forge Division ....	110
Stupakoff-Div., The Carborundum Co. ....	154
*Superior Tube Co. ....	128

<b>T</b>	
Tennessee Coal & Iron Div., United States Steel Corp. ....	17
*Thomas Flexible Coupling Co. ...	114
*Thomas Machine Manufacturing Co. ....	126
Timken Roller Bearing Co., The Back Cover	
Tippins Machinery Co. ....	150
Townsend Company, The ....	89

<b>U</b>	
Udylite Corp., The ....	101
*United Air Lines ....	24
*United Engineering & Foundry Co. ....	
Between Pages 126 & 127	
United States Steel Export Co. ...	17
United States Steel Corp. ....17 & 25	
United States Steel Supply Div., United States Steel Corp. ....	17
U. S. Steel Wire Spring Co., The	127

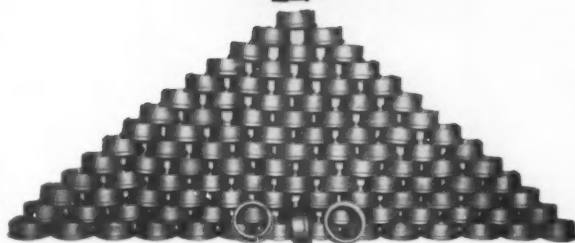
<b>W</b>	
Wallack Bros. ....	153
Ward Steel Co. ....	96
*Weirton Steel Co. ....	41
Weiss, B. M., Co. ....	153
Weiss Steel Co., Inc. ....	153
*Wheelabrator Corporation. ....116 & 117	
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp. ....	98
Wolf Enterprises, Inc. ....	153
Worcester Stamped Metal Co. ...	124

<b>Y</b>	
*Youngstown Welding & Engineering Co., The ....	145

### CLASSIFIED SECTION

Business Opportunities ....	153
Clearing House ....	148-153
Contract Manufacturing Appears in first and third issue of each month. See June 21 & July 5	
Employment Exchange ....	154
Equipment & Materials Wanted..	153

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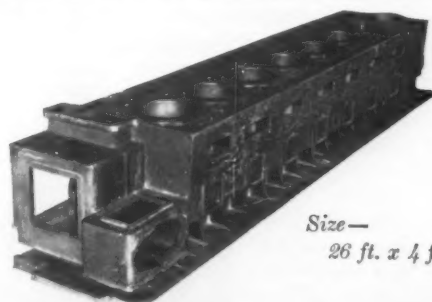
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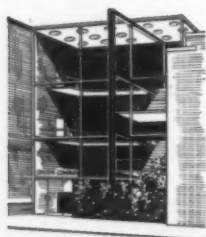
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# Top

Those who reach the top in business are usually those who, even while mastering their own responsibilities, are intensely curious about the other fellow's. Take the case of Robert Wood, which may very well be his right name. Every month, he'd sit down with a panel of his industry's experts and absorb every word. Then he'd look up his industry's ace reporters to get all the current news. Finally, he'd study competition to see what it was making and selling, and how. Robert Wood could well afford all this, for his primary investment was his time. The business papers of his industry did the rest. They were his panel of experts, his ace reporters. Their advertising pages showed what competition was up to, and how.



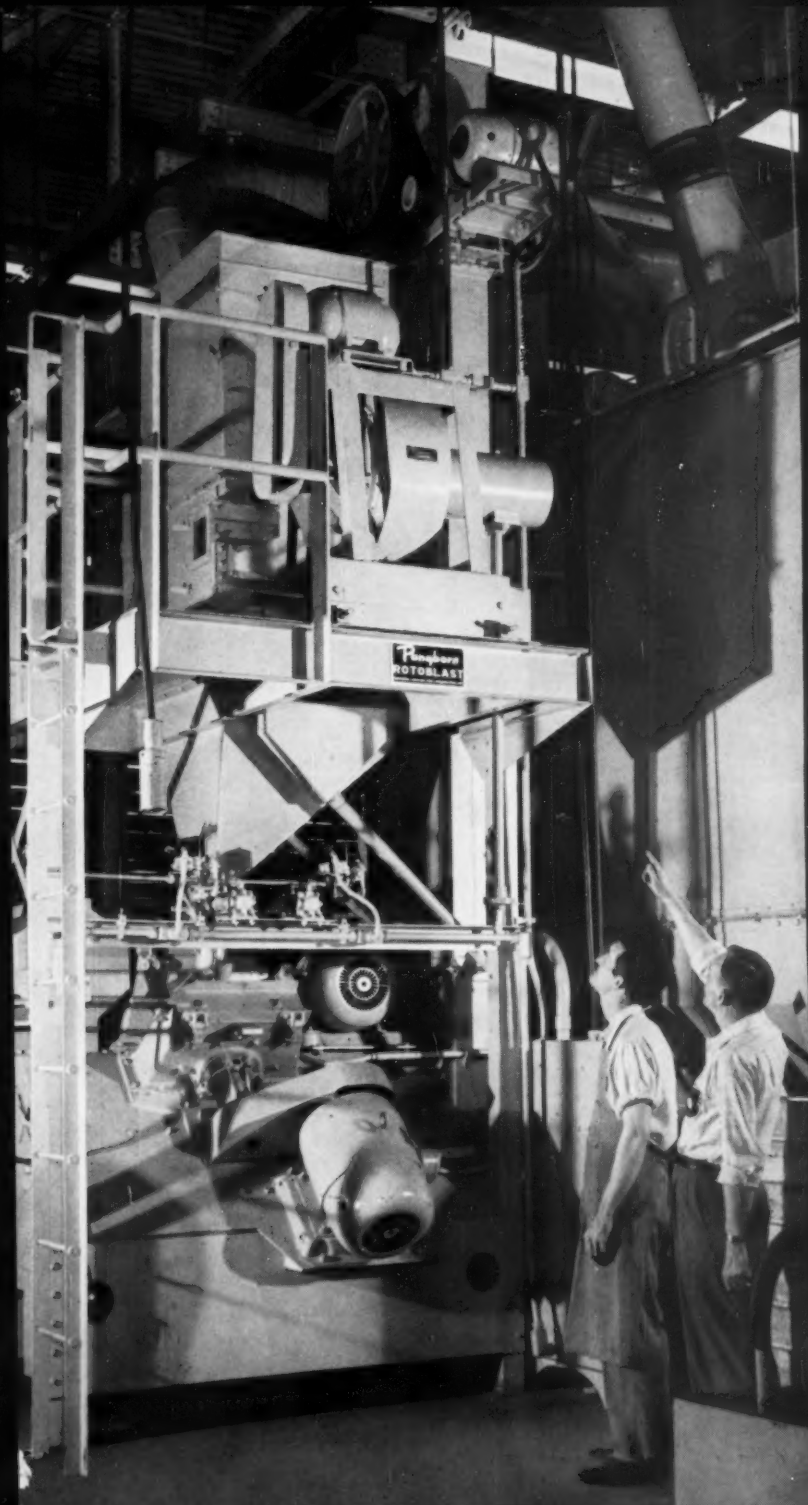
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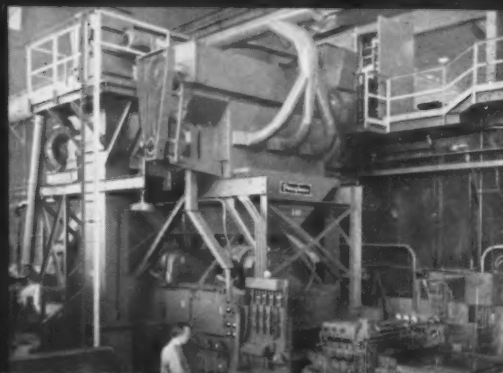
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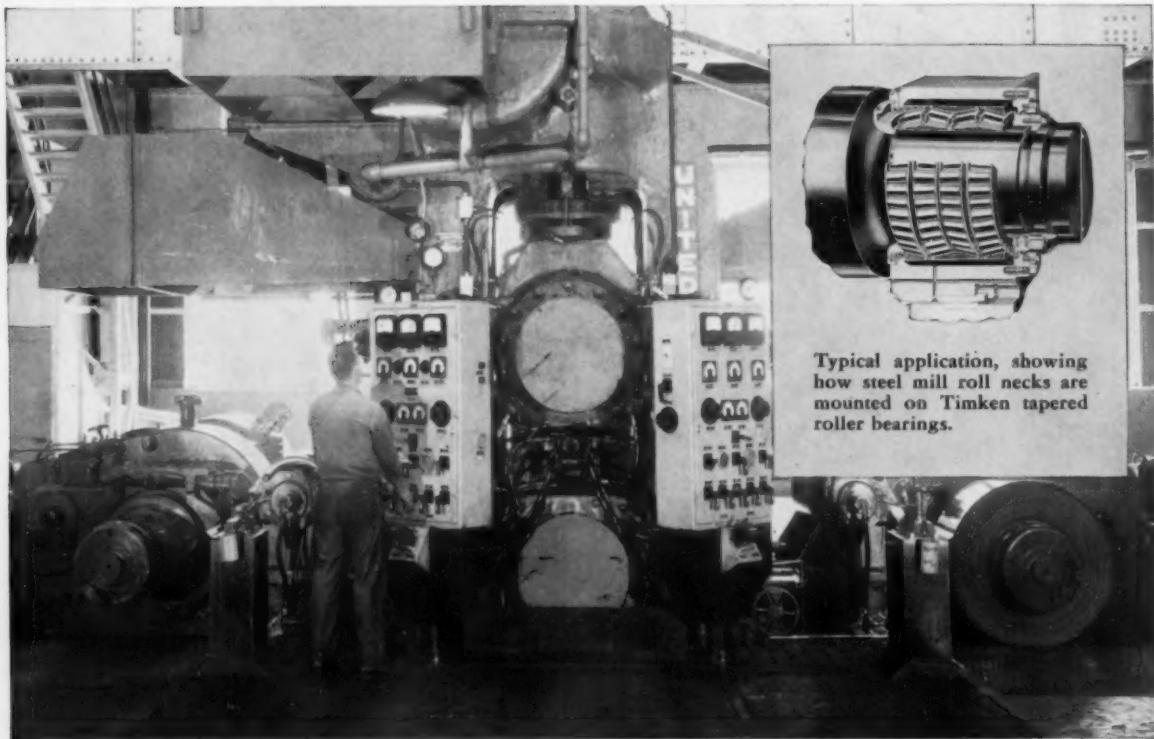
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# Scrap loss minimized with reversing cold mill back-up rolls on **TIMKEN®** bearings



Typical application, showing how steel mill roll necks are mounted on Timken tapered roller bearings.

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